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# HAND-BOOK

OF

# VIRGINIA.

FIFTH EDITION.

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BY THE  
COMMISSIONER OF AGRICULTURE.

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RICHMOND, VA.:  
JOHNS & CO., BOOK AND JOB PRINTERS,  
1886.



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OF

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COMMONWEALTH OF VIRGINIA,  
DEPARTMENT OF AGRICULTURE,  
RICHMOND, 1886.

To His Excellency FITZHUGH LEE,  
*Governor of Virginia :*

SIR :

I have the honor to present to you a Hand-Book of Virginia, fifth edition, revised and enlarged, with maps.

Very respectfully and obediently yours,

RANDOLPH HARRISON,  
*Com'r of Agriculture.*

1909  
NOV 2 1909  
C. OF A.

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## PREFACE TO THE FIFTH EDITION.

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The edition of this book published last year was speedily exhausted, and still the applications for copies are frequent. As long as there were any disposable they were sent in response to such requests as were considered reasonable—a preference being given to persons outside of the State, or to those of our citizens who wanted to send them abroad. They were put forth in faith, just as the merchant advertises his goods. He who fails to advertise freely now-a-days "gets left in the cold"; the stream of business passes him by and flows to others who set forth clearly the attractions they have to offer. The people of the great Northwest have acted upon this principle and have attracted immigration and capital to their respective States by a system of advertising such as the world has never seen before. The time will come when Virginia will pursue the same policy—will make a liberal venture and receive a rich return. Meanwhile we must do what we can, and make a modest venture, if we cannot afford more. So, moving in the track indicated by the Legislature in the bill creating the Department, I publish another edition of the Hand-Book, hoping that its truthful, though brief and impartial, description of Virginia may be the means of inducing many worthy people seeking homes to come and examine this most inviting field for immigrants.

Every effort has been made to correct errors in the previous editions, and to incorporate all improvements of a general character and interest in the descriptions of sections and counties. All new lines of railroad have been traced in the map accompanying the Hand-Book, and many corrections made. Of course many and great imperfections will remain, and will be discovered by the critical reader, throughout the book, but they are there in spite of painstaking efforts to discover and amend them.

That no part of the State should be neglected in this attempt to set forth its advantages and attractions, the aid of about three hundred of our leading citizens was invoked. A circular was prepared and sent to several correspondents in each county (and also published in nearly every paper in the State, all of which, I gratefully acknowledge, gave it gratuitous insertion) requesting, in substance, a concise statement of any attractions or advantages overlooked in the last description, or improvements added since, with which the respective counties should be credited. The number of responses was larger than expected—very much larger than on the occasion of the last issue of the Hand-Book, when a similar call was made. The thanks, not only of the Commissioner, but of all the people of the State, are due to the public-spirited gentlemen who have furnished papers descriptive of their counties. I thought of making an open acknowledgment, crediting each county with the name or names of the gentlemen who had taken the trouble to act as topographers, but was deterred by the reflection that it might not be

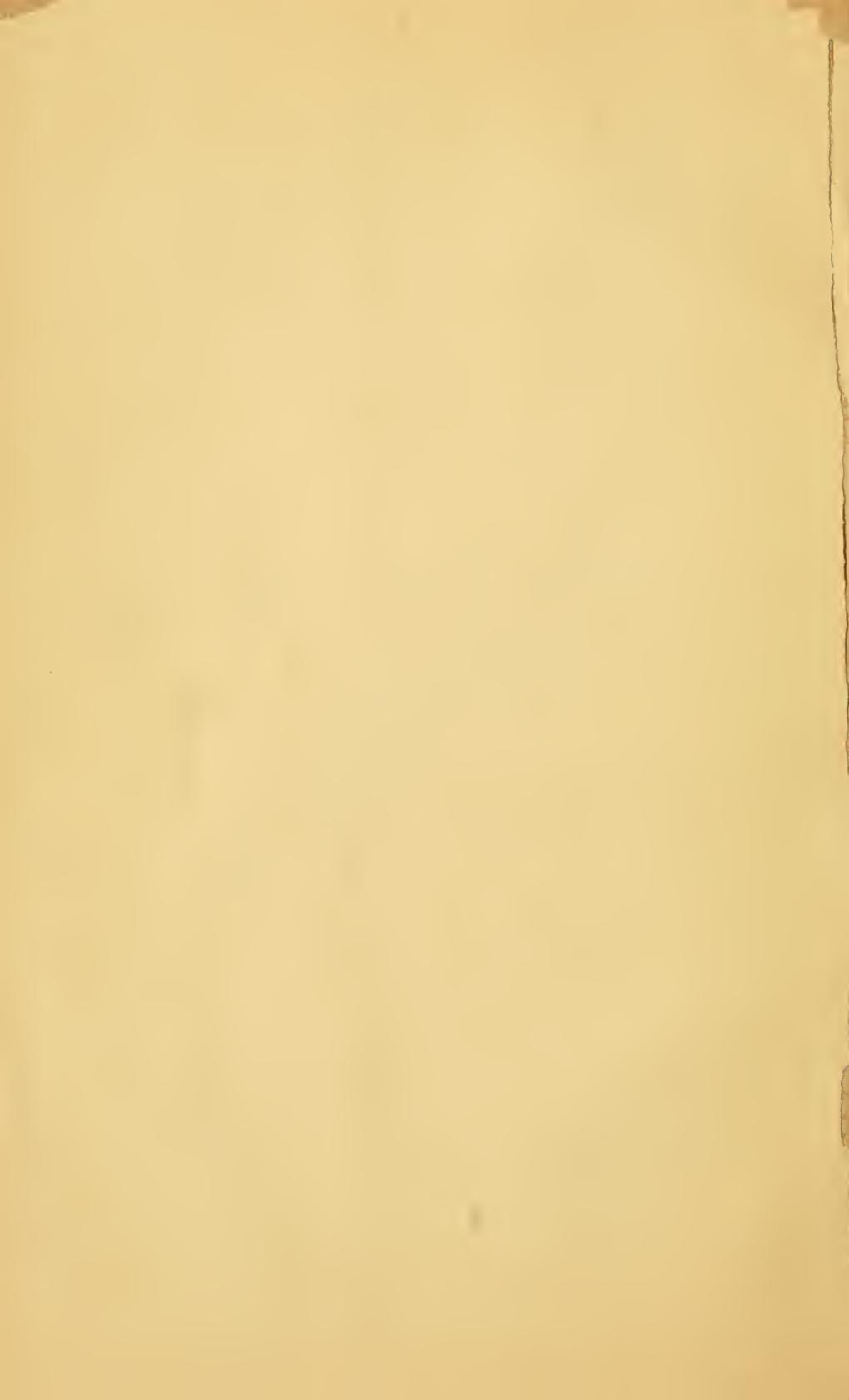
concise description of said county—soil, climate, products to which it seemed best suited—its resources of all kinds, as minerals, timber, water-power, &c.—its advantages and attractions, including accessibility to market—all these items of information for the guidance of intending settlers I hoped to get from the fountain heads in every quarter of the State.

But the responses have been few—instead of the valuable descriptive paper asked for from each county, I have received at the rate of one from each ten. To those correspondents who complied with my request, I beg leave to return grateful acknowledgments, and to the many who did not, as well as to the public, I would express my regrets that a so meagre description of not a few counties had to be given—that they are not credited with various improvements, which have been made in the last year or two, and which are brightening their prospects and making them more attractive.

The papers descriptive of the Piedmont division and the Northern half of the Valley, from Botetourt to Jefferson and Berkeley, were contributed by Captain Richard Irby, general agent of the "Bureau of Immigration," and the papers upon the Southern half of the Valley, "Blue Ridge," and "Appalachia," are the work of Capt. C. R. Boyd, of Wytheville. To those who know these gentlemen it is unnecessary that I should speak of their marked fitness for giving a graphic description of the resources of these sections of the State, with which they are, perhaps, more familiar than I am with the Eastern division.

RANDOLPH HARRISON, *Commissioner.*





SYNOPSIS,  
OR  
BRIEF GENERAL REVIEW  
OF  
VIRGINIA.

---

Virginia—what is left since the excision of West Virginia—lies between the parallels of '36° 21' and 39° 27' N., and contains an area variously estimated at from 38,000 to 45,000 square miles. The designation "Keystone State" would be more appropriate to Virginia than to Pennsylvania, seeing that it is the one of the original thirteen States which occupies just that position—"keystone" of the arch in the grand sweep or curve of the coast from the Bay of Fundy to Florida. According to the classification of Maury and Guyot, it is the southernmost of the "Middle Atlantic" States. Hotchkiss, in his "Summary," says: "Virginia, as a whole, lies in the region of 'middle latitudes,' giving it a climate of 'means,' between the extremes of heat and cold incident to States south and north of it." Dr. M. G. Ellzey, of Washington, D. C., well says: "The geographical position and physical features of Virginia are eminently favorable to a salubrious air and delightful climate, equally removed from extremes of heat and cold."

The often-quoted expression of Captain John Smith, "Heaven and earth never agreed better to frame a place for man's habitation," shows the estimation in which Virginia was held by the early settlers.

In 1858, the Hon. Caleb Cushing, of Massachusetts, in an address delivered in Richmond, declared his belief that "without disparagement to other parts of the Union, the belt of country subtended by the Chesapeake Bay, and extending indefinitely westward, possessed the climate and other conditions most favorable to the highest development of man and the horse, the noblest of the animal creation." While this may well be considered somewhat in the light of a complimentary exaggeration, for we hold that this imaginary belt should be considerably broadened, north and south, yet it is probable that the central zone of the most favored climate lies within the limits marked out. Indeed, the truth of the utterance with regard to the horse—defining the region where he reaches the highest degree of perfection—seems now to be established beyond cavil by the conceded

preëminence of Kentucky, which has taken the place once held by the "race-horse region," and moreover is surpassing all other States in breeding horses for trotting and for all general purposes.

It is affirmed also that *men* there attain greater stature than anywhere else on the continent.

Even if this claim be regarded as untenable, it cannot be denied that the region in question is highly favored by nature.

Going from the lowlands of Virginia westward we pass from the warm alluvial districts of "Tidewater," which are tempered by the influence of the Gulf Stream, through the more elevated region of "Middle" Virginia and "Piedmont," across the "Blue Ridge" into the great limestone formation of the "Valley"—thence into "Trans-Alleghany" or "Appalachia," which is also a limestone region, in part, the difference of elevation, geological formation, distance from the sea, &c., giving an almost unlimited choice of industrial pursuits.

For more convenient reference and examination by any who are thinking of settling or prospecting in Virginia, a short description of the State is here given by grand divisions, each with the counties composing it. These are taken in the order indicated above, from east to west, viz :

	Area—Square Miles.
Tidewater Virginia.....	11,350
Middle Virginia.....	12,470
Piedmont Virginia.....	6,680
The Valley.....	7,550
The Blue Ridge.....	1,230
Appalachia .....	5,720
	<hr/> 45,000

See Map.

### THE TIDEWATER DIVISION.

The first of these, "Tidewater," is an alluvial region, rising from the sands that skirt the ocean, the "post-tertiary" formation, to the low plains nearest the Chesapeake Bay, the "pliocene"—then to the "middle tertiary," the "miocene"—the strip of country extending, as ascertained by Rogers and Ruffin, to a line passing through Mathias Point on the Potomac and Coggin's Point on James river, near City Point—there we strike the "eocene" or "lower tertiary," a formation underlying the others, and coming next in age and elevation to the archæan formation of the "middle division," which it joins in its western boundary at the head of tide.

#### SOILS AND CROPS.

The soils of this division are, in general, light, warm, easily tilled—and favored to this end with a semi-tropical climate, are, "par excellence," garden soils—admirably adapted to raising early vegetables for the great markets of the Northern cities. This is especially the character of the Eastern Shore, the Norfolk and parts of the Hampton and Gloucester peninsulas. In a more restricted sense this description of the soil is applicable to the greater part of Tidewater. The land is "kind" and easily worked—an important factor in estimating the value of land, as every practical farmer knows. The late Gov. H. A. Wise used to say of the lands of the Eastern Shore that they were more profitable than other soils which would make twice as much per acre, because, in the first, "a man and a mule could, thanks to the easy tillage and greater surface he could work, make

more crop on the light land on the strong—and in this country, where land is abundant and cheap, <sup>it may</sup> is the element most to be considered."

The products of this <sup>the poss</sup> are very varied, and can be further diversified to an almost unlimited extent.

Cotton is grown with <sup>more occasi</sup> it in several counties. *Peanuts*, the finest produced anywhere. Corn <sup>flourish everywhere. Wheat of the very best</sup> quality, and grass, except <sup>the soil is too light for these crops, as is the case</sup> with some of the most valuable <sup>up for</sup> <sup>Belgium</sup>.

Tobacco is cultivated to a <sup>small extent in some of the Tidewater counties.</sup> In colonial times it was the <sup>st</sup> <sup>vial re</sup> not only the money crop, but the currency of the colony; and the reputation <sup>all to</sup> Virginia tobacco was built upon the product of the Tidewater section. The <sup>nation</sup> grown at "Varina," on James river, had an especial reputation, and the <sup>name of</sup> <sup>nd</sup> of the place is said to have been given it because the quality of the tobacco there grown resembled that of "Varinas" in Cuba.

There is no doubt that excellent tobacco can be—*has been*—grown in every county in this section; and probably in every one in the State. The prevailing practice, however, seems to indicate that in many localities other crops have been found more profitable—hence the culture of tobacco has been abandoned in county after county, so that there are many persons who have never seen the plant growing.

But now the fashions are changing—new kinds of tobacco in demand, as, for <sup>ex</sup>, "Sumatra," which is being largely imported for cigar-wrappers—some fine, high priced variety may be found which will suit this country and be profitable here; and Lower Virginia may regain her reputation for "sweet-scented" or highly flavored tobacco.

The prediction "that Tidewater Virginia may regain her reputation for fine tobacco" is already in a fair way to be fulfilled. J. E. Booker, Esq., of the *Suffolk Herald*, has kindly sent me a sample of bright flue-cured tobacco, of the present year's growth, from a crop of nine acres made by Mr. J. J. Deyer, of Hansom's, Southampton county. The sample has been shown to several experts and was pronounced very fine. I believe the section where that sample was grown could enter the list against Granville county, North Carolina, or any other celebrated bright tobacco region, and with equal skill in management could hold its own against the best.

#### SHEEP AND HORSES.

This country is well adapted to sheep. The earliest lambs, and some of the finest in the State, are raised here, and have been shipped to New York with great profit.

Fifty years ago the finest blooded horses of America were bred here in the western counties of "Tidewater," and the adjoining counties of the "Middle Division." This was called the "race-horse region," and it was long supposed that nowhere else could this class of horse be raised in equal perfection.

#### GRASS.

This claim, and the one just preceding, that Eastern Virginia is a good sheep-raising region, may seem strange in view of the fact that it is commonly considered the very reverse of a "grass country"; but the native grasses, as wire grass, crab grass, and blue grass (*poa compressa*), are very nutritious.

Moreover, one of the results of the late war was to show that timothy, orchard

and other grasses, previously supposed to be ill-suited luxuriantly under proper conditions. Even old red timothy, &c., growing in perfection where horses Northern hay; and there is no longer any doubt grown here. Some of the best that comes to the James river between Richmond and Norfolk

the country, would grow s were surprised to find n picketed and fed upon the very finest, can be and market is made upon

#### FRUITS.

This is a fine fruit country. Apples, pear great perfection. The peach is not a sure cro

pes and small fruits grow in he greater part of this country.

#### TIMBER.

This region is well wooded, as indeed is all of Virginia, the growth varying greatly with the geological and climatic differences referred to above. In the Tidewater division we find abundance of the finest pine, cypress, juniper, white and other oaks, ash, maple, gum, locust, cedar, holly, dogwood, hickory—some walnut, sycamore, persimmon—and many other trees of minor importance. In some of the lower counties are large quantities of fine chestnut timber. All along the banks of some of the rivers we find the white mulberry—the “*morus alba*”—growing in great profusion, offering an inviting field for silk raising. This tree was introduced from Europe by Gov. Digges, one of the colonial governors, and has made itself at home along James river and its lower tributaries, flourishing and propagating itself as if indigenous.

#### NAVIGABLE WATERS.

Various writers have commented on the number of the navigable streams which indent this portion of the State. One of the oldest of them, in closing a description, says: “So that no country in the world can be more curiously watered; but this conveniency, that in future times may make her like the Netherlands, the richest place in all America, at the present I look on as the greatest impediment to the advance of the country, as it is the greatest obstacle to trade and commerce. For the great number of rivers and the thinness of the inhabitants distract and disperse a trade. So that all ships in general gather each their loading up and down an hundred miles distant. This (*i. e.*, the number of rivers) is one of the chief reasons why they have no towns,” &c.

The same remark has been made by Mr. Jefferson and others, and explains why Virginia cities have been of such slow growth until recently—since water transportation is no longer paramount.

Admitting the disadvantage in this respect, there are many counterbalancing advantages. This is a country of abundance—the rivers yield the finest fish, oysters, wild fowl; and, as remarked by Dr. Pollard, “the numerous creeks indenting this country furnish the cheapest and readiest means for a commerce which comes home to the abodes of the rural inhabitants, while the ravines and river cliffs, washed by the tides, disclose the rich marls which are destined to bestow the highest rewards upon its enterprise by spreading fertility and wealth upon the farmers who use them.”

#### MARL.

To speak of the geology of this country is to give a description of the wealth of marl underlying it—the whole region from the ocean to the head of tide proba-

bly resting upon beds of marl at greater or less depth. There are, as far as is known, no minerals here possessing value other than in an agricultural point of view, except the ochre beds of Chesterfield county, near Bermuda Hundred. The small deposits of iron ore occasionally found in the marl beds, or bog ore near the streams, do not constitute an exception worth speaking of. But the agricultural value of the marls of Virginia cannot well be overestimated—exhaustless stores of fertilizing material laid up for the future—they will some day make the alluvial region of Virginia the Belgium of America. A full description of the geological formation of this alluvial region would not be interesting to the unscientific reader, but it may be well to call attention to the difference between the marls of the more recent formations, the *pliocene* and *miocene*, which derive their value mainly from the carbonate of lime which they contain, and the green sands and olive earths which are found in the *eocene* in conjunction with the shell or calcareous marl. (Green sand is *sometimes* found mixed with the marl of the *miocene* region.)

The region of *eocene* marls extends from the falls of the rivers eastward fifteen to twenty miles. Miocene marl is often found overlying the *eocene*, and is easily recognized by the difference in the shells which it contains—scallops and others not found in the *eocene*. Beneath this (Professor Rogers, quoted by Dr. Pollard, says), and usually separated from it by a thin line of "black pebbles,"\* like those occurring on the Pamunkey, there occurs a stratum of greenish, red and yellow aspect, containing much green sand and gypsum, the latter partly disseminated in small grains, and partly grouped in large crystals. The under stratum, rich in green sand and containing a few shells in friable condition, extends to some depth below the level of the river. At "Evergreen" the whole thickness of the deposit appears to be about twenty feet.

This was said of the James river formation, but will apply as a general description to the deposits of the Pamunkey, Mattaponi, Rappahannock and Potomac, as Professor Rogers says "eocene marl is there found very similar to that on the James. On the Mattaponi the occurrence of green sand strata has been ascertained in some places, while in others the beds containing the substance have been replaced by beds of clay, which are less likely to prove valuable agriculturally. The olive earth overlying some of these beds, particularly on the Pamunkey, seems to have lost some of the carbonate of lime which it once contained, and has but a small portion of gypsum." (See report of Dr. Ledoux, p. 10.)

Much has been said of the wonderful change wrought in the lands of New Jersey by the use of the green-sand marl found in the *eocene* formation in that State, and I cannot do better than quote Dr. Pollard's remarks and citations at second hand from Prof. H. D. Rogers' report on the Geology of New Jersey, differing with him as to the "valuable constituents" of the green sand, to which its marvellous effects are due.

"Of the agricultural value of *eocene* marl there can be no doubt. It has been used with great success in New Jersey, and very profitably on the James and Pamunkey in Virginia. For some time beds containing a portion of carbonate of lime (shells) and gypsum were sought after, particularly on the Pamunkey, to the neglect of the underlying green sand. Afterwards the green sand was learned to be appreciated. On "Turkey Island Creek," in Henrico, deposits were found almost void of shells, which have been used to great advantage, particularly in promoting the growth of clover, and secondarily of the cereals. The effect of

\* NOTE.—These "black pebbles" are no doubt "coprolites," rich in phosphoric acid. See report of Dr. Ledoux, on p. 10.

green sand is very permanent as well as very efficacious from the beginning. In New Jersey it has been used in almost unmixed condition for many years, and is highly prized as a fertilizer. There, it is said, as small an application as ten or fifteen bushels to an acre is uniformly attended with most excellent effects, whether the soil be clay or a light sterile sand. Prof. Rogers quotes the following from his brother Henry D. Rogers' report on the Geology of New Jersey: "When we behold a luxuriant harvest gathered from fields where the soil was nothing originally but sand, and find it all due to the use of a mineral sparsely disseminated in the sandy beach, we must look with exulting admiration upon the benefits to vegetation conferred by a few scattered granules of this unique and peculiar substance. The small amount of green sand dispersed through the common sand is able, as we behold, to effect immeasurable benefits in spite of the great preponderance of other material, which we are taught to regard as, by itself, prejudicial generally to fertility. This ought to exhibit an encouraging picture to those districts not directly within the limits of the marl tract, where some of the strata contain the green substance in sensible proportion. It expands most materially the limits of the territory where marling may be introduced, and points to many beds as fertilizing which would otherwise be deemed wholly inefficacious."

The dark, greenish clays and sands in this region have sometimes been mistaken for green sand. These clays are destitute of fossils, and have an astringent or copperas flavor, and generally a strong sulphurous odor, though a slight sulphur odor is sometimes discovered in the best marls. Small shells, well decomposed, are often found sparsely distributed through these eocene marls, though an almost total absence of shells is sometimes observed in some of the best of them, as, for instance, those of Turkey Island creek in Henrico. Fine, sparkling scales of mica have been mistaken in these deposits for gypsum. The kinds of shell often found in the miocene and eocene marls serve to distinguish them when there is any doubt about the classification of the variety of marl. The saddle-shaped oyster is found in the eocene or green sand marls, and not in the miocene or shell marls; and the common scallop or clam is found in the latter, and not in the former.

The eocene marls have been extensively used in the past, and some are using them now, but to a limited extent generally; and the same remarks are applicable to the miocene. It is to be hoped that their use will be resumed generally, as where the deposits are accessible and of good quality there can be no doubt of the value of their application; and this particularly refers to the green sand variety. Where these latter deposits exist on the rivers, it would no doubt be profitable to transport to farms up and down the rivers, and probably over railroads for short distances where the roads touch the rivers. Formerly these marls were boated up and down the rivers in lighters, particularly on James river. As the condition of affairs improves, and farmers acquire more means, they will no doubt find it much to their advantage to use these marls to increase the fertility of their lands.

Where these marls coexist some of the effects are of course due to the lime and some to potash in the green sand, but where the latter exists in good proportion the influence is no doubt due more to the green sand than the lime. Sulphate of lime (gypsum) existing in many of the eocene marl deposits, no doubt on some soils exerts a beneficial effect.

NOTE.—It was long supposed that to the potash contained in green sand marls was due their great value in restoring wornout lands, and it is not surprising that Dr. Pollard, the first Commissioner of Agriculture in this State, active in ac-

quiring knowledge as he was zealous in disseminating it, should have been of that opinion. But that the principal value of green sand is attributable to its *phosphoric acid* seems to be clearly proven by Prof. Geo. H. Cook, LL. D., State Geologist of New Jersey. I give his conclusions as of the very highest authority.

#### GREEN SAND MARLS.

"Green sand marls have been of inestimable value and influence in improving New Jersey agriculture. They have been the means of restoring large districts of wornout land to fertility; they have improved the texture and productiveness of lands naturally too light to be otherwise worth cultivation. They continue to be used in large quantities, and constitute a valuable low priced fertilizer—very desirable where the cost of transportation is not too great.

Phosphoric acid is in all the green sand marls, and is in combination with lime or iron, forming phosphate of lime or phosphate of iron. It is not a part of the marl grains, but is mixed through the mass of them, in fine powder or in small, light green and very soft grains. It is insoluble in water, but in good form to dissolve in the soil. It is in very variable quantities in the marls from different beds, and in marls from different depths in the same bed there are considerable differences in the percentages of this substance. Some of the best marls which are sold contain 3 to 4 per cent. of phosphoric acid, while there are others sold which do not contain more than a half of 1 per cent. of this acid. Potash is a constituent of the grains of green sand marl, and makes from 5 to 7 per cent. of its weight. It is in combination with silica and silicates of iron, alumina and magnesia. It is quite insoluble in water, and though it may be soluble in some other substances, it is not more likely to be dissolved than the other mineral substances in the soil, for example, than feldspar or glass. We have no evidence that it is of any effect in growing crops, and we cannot assign any price to it. It should be of value in composts, and there is some reason to believe that the action of quicklime or of fermenting manures will liberate and make soluble some of the potash. Carbonate of lime, in fine powder, is found in some of the green sand marls, but not in all of them. Samples have been analyzed which contain 20 per cent. of this substance, while many others are found which do not contain any. Small quantities of sulphate of lime and sulphate of iron may also be found in some of the marl.

The experience of the farmers who use marl, and the chemical tests which have been applied to the marls which they approve, and also to those which they do not value, have led to the following conclusions:

1. That marls containing the most phosphoric acid are the ones which are most highly esteemed by farmers.
2. That marls containing carbonate of lime in fine powder, besides any shells that may be in them, are the best and most lasting fertilizers, though they must be used in large quantities.
3. That marls consisting of pure grains of green sand, though containing their full percentage of potash, are frequently without any fertilizing action, and their effects are not very well marked in any cases.

Accepting these conclusions as being up to the present state of our knowledge, we have not thought it of use to analyze the samples sent in this year for anything quantitatively but phosphoric acid and carbonate of lime, and qualitatively for sulphate of iron."

Station No.	FROM WHOM SAMPLES WERE RECEIVED.	Total Phosphoric Acid.	Soluble and Insoluble Matter.
		Phosphoric Acid.	
260	Edward Conover, Mapleton, N. J., (light green).....	1.01	50.19
261	Edward Conover, Mapleton, N. J., (dark green).....	1.38	50.61
265	Charles F. Tice, Williamstown, Marshall's Pits, (blue).....	1.54	.....
266	Charles F. Tice, Williamstown, Marshall Pits.....	0.70	.....
275	West Jersey Marl Co., McFarland Farm (green).....	1.09	.....
276	West Jersey Marl Co., Ware's Pits (green).....	1.12	.....

The above was quoted in full because it will apply equally well, I think, to the green sands of Virginia as to those of New Jersey.

I have before me a copy of an exhaustive report made by Dr. Ledoux, a distinguished chemist of New York, upon certain marl-beds on the Pamunkey, which he carefully examined and from which he took samples in various places for the determination of the percentage of phosphoric acid and potash.

	Phosphoric Acid.	Potash.
In one sample of green sand he found.....	9.99 per cent.	2.72 per cent.
In another.....	1.37     "	1.32     "
In "olive earth".....	6.40     "	0.53     "
Another sample .....	7.76     "	0.53     "

" Between the olive earth and the green sand is a singular deposit, varying from one to six inches in *width* (qu. depth? C. A.) and appearing everywhere at the juncture between the two formations. It consists principally of well-preserved bones, shark's teeth and other fossils, with a multitude of small nodules varying in size from that of a pea up to a circumference of three inches. These nodules are very rich in phosphoric acid, and in my opinion nothing more or less than coprolites.

The great diversity in the composition of the two samples of green sand analyzed is very striking, one containing nearly 10 per cent. of phosphoric acid, and the other only 1.37 per cent. Even this is a larger percentage than was given by Dr. Gascoyne in the laboratory of this Department. Samples of the different deposits were brought from the same locality and carefully tested here, and the green sand (the best) showed only..... 1.01 per cent. phos. acid. The olive earth..... 2.64     "     " Coprolites ..... 23.47     "     " Bones from rich streak..... 34.29     "     "

The samples analyzed here may have been taken from the outer edge of the deposit, where it has been exposed and weathered so as to lose some of the phosphoric acid. Even the smaller percentage shown, however, is enough to account for the great and lasting effects which have resulted from the use of this fertilizer. It will be observed that the average of the six samples analyzed by Prof. Cook is phosphoric acid, 1.14 per cent., so that if the samples gotten by Prof. Ledoux were not far better than the average, Virginia green sand is much richer in phosphoric acid than the New Jersey.

The "coprolites" are evidently the "black pebbles" of Prof. Rogers, above-

referred to. If these and the other fossil remains in the "rich streak" could be found in large quantities and in an accessible place they would prove a mine of wealth to the owner of the deposit. Thorough investigation is needed.

#### HEALTH.

An idea has somehow gained currency that the Tidewater region of Virginia is an exceedingly unhealthy country. It is conceded to be very desirable in other respects, but the fear of "Malaria" keeps away many who otherwise would gladly settle there.

That ague and fever prevails in some sections, it is idle to deny. Other localities in the Tidewater region are free from malarial diseases, and there is a remarkable immunity from fevers of a typhoid character. I agree with the late Dr. Pollard in thinking that "if the fact could be known, no more mortality and as much longevity would be found in Tidewater as in the mountainous regions of Virginia."

#### RAILROADS.

This country, already blessed with exceptional facilities of transportation by water, as has been shown, is now penetrated in various directions by railroads, securing quick carriage of vegetables, fruits, and other perishable commodities to the great markets of the northern cities. The New York, Philadelphia and Norfolk railroad now runs through almost the entire length of the Eastern Shore Peninsula, bringing not only that shore but the counties tributary to Norfolk and Newport News in close communication with Philadelphia and New York.

On the Southside the Norfolk and Carolina, connecting Norfolk with Edenton, the Norfolk and Western with its branch from Petersburg to City Point, the Seaboard and Roanoke, the Atlantic and Danville, which last has recently been extended from deep water at Claremont, on James river, in Surry county, in a southwest course through the Tidewater counties of Surry and Sussex, into Middle Virginia; these, with several shorter roads—the Surry, Sussex and Southampton, the Suffolk and North Carolina, the roads from Norfolk to "Virginia Beach" and "Ocean View," intersect the Tidewater division south of James river. On the north we have the Chesapeake and Ohio penetrating the Peninsula from Richmond to Hampton Roads, and the York River road from Richmond to West Point at the head of York river, and a road (the Richmond and Chesapeake) has been surveyed from the capitol to the Chesapeake Bay near the mouth of the Potomac. The settler in search of a home easy of access can surely find it here, and with it cheap lands, easily cultivated—cheap living, an orderly, industrious, and in many sections an exceedingly thrifty population, ready to welcome the honest immigrant who will make his home among them.

This last assertion is equally true of all other parts of the State.

## TIDEWATER VIRGINIA BY COUNTIES.

## GROUPING IN NATURAL SUB-DIVISIONS.

	COUNTIES.
The first peninsula, or "The Northern Neck" .....	{ King George. Westmoreland. Richmond. Northumberland. Lancaster.
The second, or Middlesex Peninsula.....	{ Essex. Middlesex.
The third, or Gloucester Peninsula.....	{ King & Queen. Mathews. Gloucester.
The fourth—the King William or Pamunkey Peninsula.....	{ Caroline. King William.
The fifth, or "The Peninsula" .....	{ Hanover. New Kent. James City. York. Warwick. Elizabeth City.
The sixth—Richmond or Chickahominy Peninsula.....	{ Henrico. Charles City.
The seventh, or Southside Peninsula.....	{ Prince George. Surry. Sussex. Southampton. Isle of Wight. Nansemond.
The eighth, or Norfolk Peninsula.....	{ Norfolk. Princess Anne.
The ninth peninsula—"The Eastern Shore" .....	{ Accomack. Northampton.

In the following brief description of each county they are taken in alphabetical order, except the first two, which are so much alike in soil, climate and population that Northampton follows Accomack, much of what is said of one being equally applicable to the other.

## THE EASTERN SHORE PENINSULA.

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### ACCOMACK

is the northernmost of the two counties belonging to Virginia on the "Eastern Shore" Peninsula. It contains 245,314 acres of land; valuation, \$1,875,616; value of town lots, \$83,000, and a population of white, 15,015; colored, 9,393; total, 24,408—is about 40 miles long, with an average width of ten miles, the Atlantic Ocean bounding it on the east and the Chesapeake Bay on the west. There are numerous arms and inlets from both, extending into the main, and a chain of islands on the ocean side acting as breakwaters to the higher lands. The salt air from the surrounding sea, and the high temperature of the gulf-stream make the climate milder and less liable to frost than other localities much further south. Until recently, communication with market was by steamboat and sailing vessels only (a fine line of steamers plies regularly between this county and Baltimore)—in this way the staple crops, the sweet and Irish potatoes, the onions, peas, cabbages and other vegetables, and the small fruits were sent to the markets of Baltimore, Philadelphia and New York, bringing an annual return to the producers of a million and a half of dollars.

In addition to these facilities, the building of the New York, Philadelphia and Norfolk railway from Delmar on the dividing line between the States of Delaware and Maryland to "Cape Charles City," near the mouth of Chesapeake Bay, and thence making the city of Norfolk by a line of fast and elegant steamers, completes the chain of the great short line, North and South, and lessens the time of transit some ten hours between New York and points South, and puts the truckers and fruit-growers of this Peninsula in close communication with New York and Philadelphia. The road is admirably located along the central line of this county and Northampton, almost an air-line, with a maximum grade of less than ten feet, first-class steel rails and an equipment unsurpassed.

The soil of this section is a light sandy loam, warm and easily tilled; the sub-soil is red clay. Corn and oats were long the staple crops of the Eastern Shore; but with the unsurpassed facilities for marketing small fruits and vegetables, the latter industry has come to be the principal one. This region will soon become one of the principal market gardens for the great cities of the North. The climate is pleasant and salubrious, the salt air being wafted over the Peninsula from almost every point of the compass.

A correspondent writes August, 1886: "No county of the State has improved more rapidly than this within the last two years. The revolution began with the building of the New York, Philadelphia and Norfolk Railroad (referred to above) and is quietly but rapidly and surely working out its destiny, which is to be the vegetable, fruit, fish and shell-fish supplying section for the great cities of the country.

This close communication has brought its superior points of climate, soil, location and shipping facilities to the notice of the eastern, western and northern people, who are taking advantage of them beyond the expectation of the most sanguine; by them new ideas have been advanced and economic methods suggested, which have been generally adopted by the old residents and found useful and profitable. The crops this year have brought good prices, strawberries paid both this and last year four hundred dollars per acre; white or Irish potatoes and green peas one hundred, and other vegetable crops, so far as tried, have given very satisfactory returns. The peach will shortly be the fruit crop that will receive the most attention. Experienced Delaware growers, who have undertaken it here, are much pleased with the out look and predict that its ultimate out come will surpass that of the Maryland and Delaware peach belt now so favorably known throughout the country.

It may be added that no section of the State has as cheap or better transportation, it being supplied by strong competing companies by land and by water."

The brief description here given of Accomack is applicable in every particular, except that the soil of the latter is in general rather more sandy, to the sister county of

#### NORTHAMPTON,

which occupies the southern end of the Peninsula. It is thirty miles long, with an average width of only about five miles, and contains 103,255 acres of land; valuation, \$974,818; with a population—white, 3,889; colored, 5,263; total, 9,152.

All the advantages possessed by Accomack, of easy and quick access to market, warm and cheaply tilled soil and salubrious climate are enjoyed by the citizens of Northampton.

Fish, oysters and wild fowl form a source of cheap and luxurious living, and large revenues to the inhabitants of these counties. There is no part of the country cheaper to live in than this. About one-fifth of the population of the Peninsula is engaged in planting oysters and fishing, from which a good living is easily made.

Churches are numerous and public schools are convenient.

The taxes are moderate, being about 90 cents in the hundred dollars' worth of property.

Political freedom here (and everywhere else in Virginia) is a fixed fact. One of the strong Democratic towns elected a Republican (a leader of his party) for its mayor because he was a good and efficient man.

The county roads are well located and naturally good. There is nothing lacking here (I quote a most intelligent correspondent), "but people—new people—new ideas. We are as intelligent and industrious as most people, but we need new life to pull us out of the grooves and ruts and turn us into different and more progressive channels."

The same writer says: "These people show, 'strongly marked,' the individuality of the English settlers, of whom they are the eldest in the United States," retaining in a marked degree the quaint manners and expressions of the mother country a century and more ago.

"Lands are for sale at from ten to fifteen dollars per acre," and there is no need of a prophet to inform us that they will rapidly enhance in value."

The revolution spoken of by our correspondent in Accomack is working in Northampton as well. The southern terminus of the great railroad, connecting with Philadelphia and New York, is in this county, at Cape Charles City on the Chesapeake Bay, where a steam ferry connects with Norfolk and the south, and a great

Impulse has been given to agriculture, and trucking in particular, by the facilities afforded by the railroad which passes through the middle of the county for about twenty miles.

"All the farms," writes another valued correspondent, "are within a short distance of a railroad depot or a water course, making the transportation to market easy and convenient."

Two correspondents have sent descriptions of Northampton, but much that is said has been forestalled in depicting the advantages of the sister county, so that I must content myself with publishing only condensed extracts.

"The climate is temperate, the almost insular position giving Northampton an exemption from violent extremes of heat and cold. For the past 18 years the mean annual temperature has been 58° 48'; and the mean rainfall 43.58 inches. There are few places where you will see more hale and hearty looking old people than here."

The soil is a sandy loam with a sandy clay subsoil—sufficient clay to hold manure, and sufficient sand for drainage. The land has been worn but responds readily to improvement; in fact the yield from a light manuring is surprising.

The crops principally cultivated are corn, potatoes, both sweet and Irish, and onions; and since the opening of the railroad, peas and berries. The county is well adapted to general trucking and fruit culture. Black and English walnut and pecan grow and bear well here.

"Farms are from 100 to 600 or 700 acres, value generally \$20 to \$25 per acre, more or less according to improvement and quality of soil." (This shows a rapid advance since the statement above was sent me, less than two years ago.—C. A.)

#### NORTHAMPTON COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Coarse sand*, from Oceahonock creek, collected by Rich'd Lamb.—C. & S. E.
2. *Brick clay*, from same locality.

#### CAROLINE,

though classed as one of the Tidewater counties, is in part upon the primary or archaean formation. It was formed in 1727 from Essex, King & Queen and King William; is about 28 miles long and 20 wide; contains 337,357 acres of land; assessed at \$1,637,236; value of town lots, \$129,236; population—white, 7,615; colored, 9,616; total, 17,231.

It is drained by the Rappahannock, the Mattaponi, the Pamunkey and their tributaries, which are numerous, and is one of the best watered counties in the State. The various rivers and creeks give much bottom land which is very productive, and fine water-power and mill sites. Corn, wheat and tobacco are largely grown. The tobacco of this county is of first-rate quality, there being a belt of the "upper jurassic" formation all along the line between the tertiary and the primary formations; and the lands of this character are admirably suited to the finer qualities of tobacco, as has been remarked in the general description.

Clover and orchard grass grow well here,—perhaps the finest orchard grass seed brought to the Richmond market is produced in Caroline, and first rate clover seed along with gilt-edged butter from registered Jersey cows. Phosphates are said to act remarkably well on these lands. Sheep are profitable, especially raising early lambs for the Northern markets.

The northern boundary of this county extends to within eight miles of Fredericksburg, and the southern to within twenty of Richmond city. Through its

entire length from south to north passes the Richmond, Fredericksburg and Potomac railroad. This, with the Chesapeake and Ohio near its southern edge and the Rappahannock river on the northern boundary, gives convenient access to and choice of various markets.

Large numbers of Northern families have settled in this county, and are said to be well pleased with their new homes amongst a thrifty, intelligent and moral people.

### CHARLES CITY

was one of the original shires of Virginia, and was established in 1634. It is 30 miles long, with a mean width of about eight miles, and contains 113,365 acres, assessed at \$628,286. Population—white, 1,765; colored, 3,751; total, 5,516.

This county occupies the Peninsula formed by the Chickahominy and James rivers. The surface is mostly level or gently undulating. The lands on the rivers are generally of excellent quality, and constitute a large proportion of the area. Many fine estates and sundry old colonial residences grace the banks of the James—among them the homes of two Presidents.

The productions are corn, wheat, oats, peanuts, clover, and the finest timothy hay and orchard grass. The grape produces abundant crops, and is rarely affected with disease.

An enterprising Northern settler has been experimenting here in grape culture with signal success. His results, as reported to the Commissioner, have been astonishing.

A prominent citizen writes: “Our climate and soil is suitable to an endless variety of fruits and vegetables, many of the former growing wild and in great profusion.”

The timber consists of oak, pine, elm, ash, poplar, &c. Large amounts of ship timber, cord wood and poplar for wood pulp are annually sold and shipped to Northern markets.

Lying as Charles City does between two navigable rivers, and having a railroad (the Chesapeake and Ohio) skirting its northern boundary and passing through its northwestern corner, its means of transportation to the markets of the country are convenient to all parts.

Marl is abundant, both cocene and miocene—some of it rich in *green sand*.

### ELIZABETH CITY

was one of the eight original shires into which Virginia was divided in 1634. Its form is nearly a square of seven miles on a side. It lies on Hampton Roads, Chesapeake Bay and Back river, and is intersected by several creeks. The surface is level and the soil fertile, some of it highly so. Population—white, 4,154; colored, 6,533; total, 10,687. Number acres of land, 30,761, assessed at \$641,268; value of town lots, \$46,676. There are 15,000 acres in timber, consisting of pine, gum, oak, ash and poplar. The productions are corn, wheat, oats, grass and market truck—the latter industry rapidly increasing. The supply of fish and oysters of the finest quality is almost inexhaustible.

Elizabeth City is penetrated and almost surrounded by navigable waters, and is in daily communication with Norfolk, Richmond, Baltimore, Washington, Philadelphia, New York and Boston, by regular lines of steamers to each of these cities, affording great advantages to truck and fruit growers.

The Chesapeake and Ohio railroad has its terminus at Old Point Comfort, so

well known for the grand fortress located there, and the Hygeia Hotel, now resorted to by thousands as a winter sanitarium and luxurious resting place, while in summer it is equally popular for its sea breezes and salt baths.

Hampton, the county seat, is a thriving town of about 2,000 inhabitants. Here is located that noble institution, the Hampton Normal and Collegiate Institute, for the education and training of negro and Indian students with accommodation for six hundred. The admirable management and successful operation of this institution is too well known to need description.

Near Hampton is also located the National Soldiers' Home for 2,500 disabled volunteer soldiers, with beautiful grounds and buildings.

All these give employment to a host of mechanics and laborers, and a home market for a large part of the farm products, making Hampton one of the most prosperous towns in the State.

The climate of Elizabeth City is delightful, the average temperature being 75° in summer and 44° in winter.

#### ESSEX

was formed in 1692 from Rappahannock county—the records of the original county remaining in its archives. It lies on the south side of the Rappahannock river, about forty-five miles northeast of Richmond, and is about thirty-five miles long and six wide. The population is 11,037; area, 165,578 acres, assessed at \$784,601; value of town lots, \$58,762. It is well watered by numerous tributaries of the Rappahannock river, some of which are navigable. Rappahannock river is well stocked with fish of all kinds common to this latitude, and oysters, and is navigable to the city of Fredericksburg, which is about fifty-five miles above Tappahannock, the county seat of Essex. Tappahannock, the port of entry for the district, has 700 or 800 inhabitants, a large sumac mill, canning house, and a foundry and machine shop.

The Weems Line of steamers run three boats a week to and from Baltimore, and a boat twice a week to Norfolk. Vessels carry grain to Baltimore for four cents per bushel; to Norfolk, three cents.

The surface of the county is generally level or slightly rolling. The river lands are, where properly drained, very productive and valuable. Back from the river the soil is more sandy, but productive. On Dragon Swamp, which separates Essex from King & Queen, are some fine wheat lands with a heavy, tenacious soil of great fertility. This county was once the seat of great wealth, and still produces fine crops of corn, wheat and oats. Tobacco has been, to a small extent since the war, profitably raised.

There are several large peach orchards in this county of ten or twelve thousand trees each. Melons and other fruit are largely shipped from the various wharves along the river.

Clover and orchard grass hay have increased tenfold within the last two years, a most gratifying indication of improved farming! Marl is abundant in many parts of the county, and has been applied with great benefit in days gone by. Gypsum and commercial manures are found to act well, and clover and orchard grass flourish here. Peanuts might be profitably cultivated. Good land can be bought at from \$5 to \$10 per acre.

#### GLOUCESTER

was formed in 1661 from York. It is twenty-seven miles long and about eight miles wide, and contains 134,504 acres, valued at \$1,029,713. Population—white,

5,312; colored, 6,533; total, 11,872. It lies between Mobjack bay and York and is watered by Ware, Severn and North rivers and by numerous creeks. Piankatank river forms part of its northeast boundary. These streams give very extensive tidal waters, mostly navigable for large vessels, and filled with fish and oysters of the finest quality.

"No point in the county is very far from deep water. Bordering upon the latter rivers the land is low and alluvial, and, where properly managed, very productive. Running back of this the lands become higher, the soil of clay or sandy loam, with numerous rich flats along the many streams which flow through the upper portions of the county. Marl is found everywhere, underlying the lands of the low grounds at from two to eight feet below the surface, and cropping out of every hillside among the highlands. Gloucester was before the war one of the large wheat-growing counties of Tidewater. All the grains flourish here—corn, wheat, rye, oats and barley. The grasses, where proper attention is paid to them, grow to perfection. The attention of many of our people in the lower end of the county is being turned to trucking, to which our soil and climate prove admirably adapted. Tobacco does well, and where grown by those who understand its management, is profitable. Peanuts also have been profitably grown. As to fruits, few parts of Eastern Virginia produce them to greater perfection. The culture of fruit is rapidly increasing. Among the large fruits, pears prove the most profitable, and strawberries among the small. Grapes are beginning to be grown for market, and are paying well. A neighbor of mine has a vineyard of Concord vines of about half acre, from which he reaps from one to two hundred dollars per annum in money, besides making an abundance of most delicious wine. In fact there is nothing proper to a temperate clime, whether of grass, fruit, vegetable or other staple crop, that cannot be here grown to perfection, with proper care and attention. The yield varies—corn from 15 to 75 bushels per acre, wheat from 6 to 30, oats from 15 to 60, &c.; English peas from 16 to 60 barrels per acre, potatoes from 20 to 90 barrels.

"Considerable amounts of sawed lumber (oak, pine, &c.), cord wood and railroad ties are exported. Not more than one-fourth to one-third of the lands are cultivated—the remainder in forests and young timber.

"Owing to her great extent of water front, Gloucester is more largely engaged in planting oysters than probably any of the counties, a very large proportion of her people deriving their livelihood almost entirely from the water. Vast quantities of fish are taken in pounds and other devices, and shipped to the Northern markets or converted into oil and guano.

"Good schools in good school-houses, public and private, exist in every neighborhood, and churches of the various denominations—Episcopal, Baptist, Methodist and Presbyterian—are placed at convenient distances over the whole county. The roads are excellent in the low grounds, and in the highlands are not so good, but being improved.

"Steamers to Baltimore and Richmond stop daily at the various wharves on the York river, while the country on Mobjack bay has a tri-weekly steamer to Norfolk, which connects at Old Point with steamers to Philadelphia, New York, Boston and Providence, and new wharves are projected with daily steamers to Norfolk and Cape Charles City. A steamer also runs several times a week from the Piankatank to Baltimore. This, together with numerous sail vessels, provide cheap and sufficient transport for the varied products of our lands and waters. A daily mail reaches every neighborhood. The county is, as a whole, healthy, the salubrity of the lower portions being unsurpassed. The lands are cheap. The

climate, owing to the presence of so many large bodies of salt water and the nearness of the ocean, is very mild in winter—snows rarely attaining sufficient depth or remaining long enough for sleighing; and the summer's heat is tempered by the sea breeze, which blows nearly every day. In the low grounds an abundance of good well water is procured at from six to twenty-five feet below the surface, while in the higher parts delicious springs bubble from the foot of every hill.

"I think no portion of the State does or can offer to the intending settler a fairer field of investment, and in few communities will those who come to settle meet a kinder or more cordial reception than here. Although the past two years have been hard upon the farmers, yet their condition as a whole is improving. The credit system is dying out, and as a consequence our people are each year attaining a greater degree of independence. Farmers are learning to concentrate their efforts, and to dispense as far as practicable with outside labor, relying more upon what they themselves can accomplish with the aid of improved implements and methods. More land is being seeded to grass and more attention paid to stock."

Much land is in the market, with good improvements, and can be had at prices greatly reduced from ante-bellum valuations. Some of the finest estates in Virginia are in this county, and it was noted for wealth and refinement before the war.

The following minerals from Gloucester were on exhibition at the World's Industrial and Cotton Centennial Exposition at New Orleans:

1. Fossil shell, with quartz incrustation, from Gloucester Point.
2. Nodules of fragments of shells.
3. Miocene marl, with green sand, from Robins' Mill.

### HANOVER

was formed in 1720 from New Kent; population—white 9,294, Indian 12, colored 9,282, total 18,588; there are 291,911 acres of land, assessed at \$1,851,979.

It lies between the Pamunkey and Chickahominy rivers; the northeast line is formed by the North Anna and Pamunkey, the latter stream being formed near the centre of that line by the junction of the South Anna with the North Anna. The central parts are well drained by tributaries of these main streams.

Like Caroline, this county is partly in the archæan and partly in the tertiary formation, the line between the two dividing it into two sections nearly equal in area. The Richmond and Fredericksburg railroad follows this line (very nearly) along its whole course between the two cities.

The surface in the eastern part is generally level, and the soil a light sandy loam, well suited to trucking. The sweet potato here attains its greatest perfection, and the melons of Hanover are unsurpassed. In the central and western portions the surface is more rolling, and the lands suited to the culture of tobacco, the cereals and grasses.

On the Pamunkey are some fine wheat lands.

There are many fine estates, and the farmers are intelligent, judicious and industrious. The farm products aggregate a great bulk and value, and bring into the county large sums of money.

Marls of several sorts, both miocene and eocene, with green sand of the richest quality, are found here, and have been very profitably used on the lands.

Recent discoveries of deposits of phosphate of lime have been made on the Pamunkey river.

Mica, feldspar, asbestos and gneiss are found in the western half of the county. This is a fine county for immigrants with small capital and industrious habits. The trucking and canning business can be, and is, made very profitable here by persons familiar with gardening.

The railroad facilities of this county are excellent. Besides the R. F. & P. railroad passing through from north to south, the Chesapeake and Ohio intersects it in a north and northwest direction, having a course of nearly forty miles in Hanover, and the Richmond and York River railroad skirts its southeast corner.

#### HANOVER COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Gneiss, with garnetts.*
2. *Orthoclase feldspar crystals, from mica mine near Noel station, C. & O. Ry.*

The following from Virginia Department of Agriculture :

3. *Marl*—Dr. Christian, St. Peter's Church.
4. *Asbestos*—from Rockville : Leake.
5. *Shale*—Little River.
6. *Lignite*—Jura-Trias.
7. *Marl*—Old Church : G. L. Ernest.
8. *Green sand marl*—Hickory Hill : Gen. Wms. C. Wickham,
9. *Green sand marl*—Hickory Hill : Gen. Wms. C. Wickham.
10. *Coprolites*—Bassett farm, Pamunkey river. Contains 23.47 per cent. phosphoric acid.
11. *Bones, &c.*—Bassett farm. Contains 34.39 per cent. phosphoric acid. Analyzed by Dr. W. J. Gascoyne.
12. *Olive earth*—Bassett farm. Contains by analysis of Dr. Gascoyne 2.64 per cent. phosphoric acid.
13. *Green sand.*

#### HENRICO

was one of the original shires into which Virginia was divided in 1643. Its length is 27 miles; mean breadth, about 8 miles. The surface is undulating; soil on the rivers very productive. It is drained on the south line by James river, and on the north by the Chickahominy, and by their tributaries. It produces largely of corn, wheat, oats, trucks, and some tobacco. The population, including Richmond, is 83,575—white, 45,867; colored, 37,708. Number of acres of land, 163,322, assessed at \$4,736,474; value of town lots, \$586,035.

Having the large city of Richmond, with a population of 70,000, near the centre of its south border, and four railroads passing through this county, the products of the farm have quick, ready sale and small cost of carriage. Its productions are large and varied, and the profits of farming as good as in any part of the country. Green sand marl has been found in the lower or eastern part of the county, and used on the land with excellent results; also white marl, rich in lime, abounds in the lower end, and has been very profitably used. Grass succeeds well. There are several large nurseries and many large orchards and vineyards in the county; and dairy farming is extensively carried on.

The planting of vineyards is going on rapidly, as experience has shown that this county is admirably adapted to grape-growing. The "Norton," the best of American wine grapes, except the "Cynthiana," which is of the same family, originated just outside of Richmond, and almost all the native grapes do well

here. A few years will probably see Richmond the centre of a great wine-making district.

The Richmond and Alleghany railroad runs along the southern border of this county, and the Chesapeake and Ohio, the Richmond and Fredericksburg, and Richmond, York River and Chesapeake and the projected Richmond and Chesapeake railroads pass through the county.

Granite in great abundance, potter's clay and coal exist in Henrico. "Natural" coke of excellent quality is largely mined in the upper part of the county. Iron pyrites have recently been discovered in this county three miles below Richmond.

Richmond, the capital and the largest city in the State, is situated in this county, on the north bank of James river, at the head of tidewater. It has extensive wharves and docks, with a depth of 18 feet of water over the bar, to be increased to 24 feet. The tonnage of the port of Richmond amounted to the following in 1881: Steamers, 490,000 tons; sailing vessels, 205,000 tons. This does not include river steamers, tug-boats, or small sailing vessels. The water-power is afforded by a fall of 84 feet. At the lowest flow of the river this fall produces 9,500 horse-power. The whole of this power now in use is 4,200. From Bosher's dam, nine miles above the city, to tidewater, is a fall of 118 feet, which, with the above flow, would produce 13,500 theoretical horse-power or 10,000 actual. For steam power the capacity is unlimited, as this city has access to the finest and cheapest steam coals.

#### STATE ASSESSMENT AND TAXES FOR 1885.

Value of real estate .....	\$32,347,805
Value of personal property.....	10,594,131
Value of income .....	1,609,478
	<hr/>
	\$44,414,591

#### MANUFACTURES.

Number of establishments.....	711
Persons employed.....	15,676
Capital employed.....	\$10,504,121
Annual sales.....	\$24,697,507

*Religious Statistics of Richmond.*

DENOMINATIONS.	No. of Churches	Member- ship.	Contribu- tions.	SUNDAY SCHOOLS.	
				Officers and Teachers.	Scholars.
Baptist—white.....	9	4,698	\$41,291 40	431	3,573
Baptist—colored.....	11	11,744	24,374 11	235	2,768
Catholic .....	3	5,700	2,855 98	61	705
Christadelphian.....	1	45	.....	.....	.....
Disciples.....	2	730	6,435 73	44	403
Friends.....	1	75	.....	.....	.....
German Evangelical.....	1	300	2,500 00	40	300
Jewish .....	3	250	6,200 00	10	150
Lutheran .....	2	410	4,635 00	22	221
Methodist—white.....	8	3,094	\$5,730 02	324	1,340
Methodist—colored.....	8	416	2,057 14	34	283
Presbyterian.....	5	1,553	23,943 35	163	1,039
Protestant Episcopal—white.....	9	2,475	61,448 52	255	1,789
Protestant Episcopal—colored.....	1	65	570 59	12	120
 Totals.....	59	31,555	\$217,978 08	1,629	13,691

## HENRICO COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Granite*, from Richmond Granite Company's quarry at Korah station, R. and A. R. R.
2. *Granite*, two finished monuments each 10 feet high, from same company as above.
3. *Granite*, two varieties of Belgian blocks for paving, from same.
4. *Granite*, Belgian paving blocks, two varieties, from J. B. Mitchell & Co., Mitchell station.
5. *Granite*, two cubes of building stone, dressed, polished, &c., from same as above.
6. *Lignite*, from "Dutch Gap" on James river, from Prof. Fontaine.
- From Virginia Department Agriculture : 7. *Green Sand Marl*, from John W. Wariner.
8. *Marl*, J. W. Wariner.
9. *Fire Clay*, Dill's farm.
10. *Quartz*.
11. *Clay*, Westham, on R. and A. R. R.

## ISLE OF WIGHT

was one of the original shires into which Virginia was divided in 1634. It is 35 miles long, with a mean width of about ten miles.

Population—white, 6,010; colored, 4,562; total, 10,572. It has 188,087 acres of land, assessed at \$1,171,928; value of town lots, \$154,967.

The surface is mostly level, and the soil a light sandy loam. The productions are corn, wheat, oats, cotton, peanuts, fruits and vegetables.

The land is easily tilled, and produces good crops. Trucking is carried on very successfully.

This county has the James river on its northeast border, and is penetrated on the south by Blackwater and branches of Nansemond river, Pagan creek and their tributaries. The Norfolk and Western railroad traverses the centre and the Seaboard and Roanoke railroad passes through the southern part. These roads, together with the navigation on the James and on Pagan creek, place all parts of the county within easy and quick communication with the markets of the whole country.

This county has valuable and extensive deposits of marl, rich in carbonate of lime. This and lime are largely used in peanut culture. Vegetables, fruits and melons are shipped from this county to the Northern cities in large quantities. The supplies of fish and oysters are very large and valuable. Timber of all the varieties native to this section is abundant. The health of this county is as good as any portion of tidewater.

#### JAMES CITY.

was one of the original shires. Its length is 26 miles, and its mean breadth eight miles. Population—white, 2,227; colored, 3,195; total, 5,422. Area, 92,014; valued at \$385,967. Here was the seat of the oldest permanent English settlement on the continent, the colony at Jamestown.

The ancient and renowned town of Williamsburg, the seat of William and Mary College, which has sent out many distinguished men from its halls, is in this county.

It lies in the peninsula formed by the York, the James and the Chickahominy rivers. The surface is level or gently undulating. The soil on the rivers is rich and productive; the ridge lands are generally light, but easily improved.

Fish and oysters abound and are important sources of food and revenue. Land sells for \$10 to \$25 for improved, \$1 to \$10 for unimproved, per acre.

Marl is abundant and very rich, often 90 per cent. carbonate of lime, and was formerly used with fine effect on the soil.

"The land answers at once to improvement in the shape of manure, but all who come here buy and work too much land for their capital," so writes one of the foremost citizens of the county, and we commend his views to settlers and Virginians generally. He adds, "labor is plentiful; good hands \$8 to \$9 per month and 'board.' All the necessities and luxuries of life are cheap and abundant."

Another esteemed correspondent writes: "The land is easily cultivated, and responds bountifully to the application of fertilizers."

Corn, wheat, oats and peanuts are the principal crops. Fruits and all vegetables do well.

Many of the farmers are embarking in the trucking business, for which it would appear they have admirable facilities.

A large business is done in lumber, railroad ties and cord wood.

In addition to navigable waters, the means of quick access to the markets of the world have been greatly increased by the extension of the Chesapeake and Ohio railroad through the centre of this county to its deep water terminus at Newport News.

## JAMES CITY COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Marl*, phosphatic green sand from the "Grove," or Carter's Grove, P. W. Hinton.
2. Phosphatic green sand marl, ground, for basis of "Carter's Grove Fertilizer," from Carter's Grove plantation on James river, from Hon. E. G. Booth.
3. *Glass sand*, from the "Trenches," 1½ miles from Williamsburg; probably the same from which glass was made by the early settlers, as mentioned by Capt. John Smith.
4. Fossil Teeth, from Jones' mill, one mile west of Williamsburg.

## KING AND QUEEN

was formed from New Kent in 1691. It lies between the Mattaponi and Piankatank rivers, which, with their numerous tributaries, drain this county and make it one of the best watered in the State. It is about 30 miles long by 10 wide, and contains 192,978 acres, assessed at \$849,001. Population—white, 4,424; colored, 6,078; total, 10,502.

The River lands, which constitute a large part of the area, are very productive, and the inexhaustible beds of marl found here afford the means of permanent improvement. The staple crops are wheat, corn, oats, rye, hay, fruits, and vegetables.

Some good tobacco is raised in the upper portion and the cultivation is gradually extending, and may, in the course of some years, obtain over the whole county as it was 100 years ago.

The farmers are, to some extent, beginning to raise trucks, chiefly Irish and sweet potatoes, to which much of the land is well adapted.

There are many good peach and apple orchards. Peaches, as a crop, are rather uncertain, as they are liable to be killed by frost after blooming. The apple crop is more certain, and early apples are destined in the future to be a source of considerable profit.

The lands are variable in quality and productiveness. Some are heavy and stiff, and well adapted to wheat, grass and potatoes. A large portion, especially on the rivers, is light, but even these generally yield good wheat crops. Many of the farmers grow good crops of clover, timothy and orchard grass hay. Some of the light lands produce profitable crops of peas. Many use pea fallows, and lately some are substituting rye instead of peas and clover as a fallow crop.

Gray marl underlies a large portion of the county and is very accessible, being dug from banks instead of having to be raised from pits. Some of it is very rich in lime, yielding upon analysis 70 to 80 per cent. carbonate of lime.

Eastern Virginia enjoys a remarkable exemption from violent storms. A severe and destructive wind is rare, and in Tidewater Virginia floods can do but little damage, owing to the fact that the lands are rolling and the rivers lie between high banks. Floods occasionally damage some of the flat lands on the upper portions of the rivers above tidewater, but the area liable to them is very small.

The Mattaponi river lies on the southwest side of the county, and is navigable almost to the upper boundary. There is steamboat navigation as well as many sailing vessels. At present no railroad passes through the county, but one is now being surveyed, and grading has begun at the eastern end (Richmond and Chesapeake). The Richmond and York River railroad passes through King William, and is accessible to the middle and lower portion of the county.

The forest contain white, red and spanish oak, yellow pine, gum sycamore, poplar, hickory, dog wood, holly, walnut, persimmon, beach, birch, etc., etc.

The county is noted for the morality of its inhabitants. There are very few liquor stores, and at the county seat liquor has *not been sold for about fifteen years, and it is an exceedingly rare thing to see a case of disorder or anyone drunk.* The population is homogeneous, many families having been living here for 150 to 200 years.

The farm hands are generally negroes who were formerly slaves, but the native white population are now gradually being hired as farm hands.

One of the leading citizens writes us: "Within the last few years there has been some immigration to this county of an excellent class of people. In the neighborhood of Walkerton and Stevensville some ten or twelve families have bought farms and settled on them. They are sober and industrious and pleased with their homes. We would welcome many more like them."

#### KING GEORGE

was formed in 1720 from Richmond county. Population—white, 3,162; colored, 3,235; total, 6,597. Area, 111,860 acres, assessed at \$807,228; value of town lots, \$2,897.

It lies between the Potomac and Rappahannock rivers, which form the north and south boundaries respectively, and furnish extensive navigable waters for the entire county; the width between the rivers being from five to ten miles, while the extent of river frontage is about twenty miles on each side.

Besides the valuable transportation facilities afforded by these tidal highways, the streams furnish large resources in fish, oysters and wild fowl.

The lands on the rivers are very good and produce valuable crops of wheat, corn, oats and vegetables, and are generally light and easily cultivated.

The means of plenteous and even luxurious living are abundant, and render this a most desirable county to live in.

There are some large and valuable estates in this county, and it was once the residence of many wealthy families.

Fruits of all kinds succeed well in this section.

Marls of various kinds are found in this county.

#### KING WILLIAM.

This county is a narrow peninsula, lying between the Pamunkey and Mattaponi rivers, which unite and form the York. It is some thirty miles long by about eight miles as its average width. Population—white, 3,283; colored, 5,468; total, 8,751. Area, 169,073 acres, assessed at \$922,715; value of town lots, \$164,553. The Pamunkey and Mattaponi are navigable for steam and sail boats of large size for about two-thirds of the length of the county, affording ample and cheap transportation to all the Eastern markets.

The York river division of the Richmond and Danville system of railroad passes through about twenty miles of the county, connecting daily with steamers for Baltimore and other points north, and semi-weekly with those for New York, Boston and Providence. Another railroad from Richmond is in course of construction, which, when completed, will cross the county near its centre, and will afford quick connection with Richmond and Baltimore. The distance to Richmond is some twenty miles by the road.

West Point, the deep water terminus of the Richmond and Danville system of

railroads, is situated at the extreme east point of the county. It is a growing town, with the best of harbors, water of sufficient depth for the largest ocean steamers, with the most extensive wharves in the south, where ships are regularly loaded with cotton, flour, lumber, &c., for Europe and South America. As might be supposed, the land lies well for cultivation. The flats along the rivers are extensive and productive; the soil throughout the county is of good quality, producing a fine quality of corn, wheat, tobacco, oats, peanuts, peas, potatoes, vegetables of all kinds. Clover, millet and other hay crops do well; timothy also does well in many places on the bottoms and improved highlands.

Large deposits of marl are found in many sections. The green sand along the Pamunkey is one of nature's best fertilizers, producing wonderful improvements wherever applied. The water supply is good and never failing. Artesian wells have been lately introduced and many have been sunk, reaching a constant flow at a depth of only a few hundred feet. The health of the inhabitants will compare favorably with any section of the south. Public schools are in successful operation and meet the wants of the people. Labor is abundant and cheap; good men can be had at from \$10 to \$12 per month and found. The climate is unsurpassed, just cold enough for ice and never too hot to work. The lands are now cheap, but prices are advancing, as quite a number of farms have been lately sold to Northern and Western settlers.

There is abundance of good marl, which has been used with much benefit to the soil. The green sand marl of King William is similar to that of New Jersey which has been found so valuable as to bear carriage considerable distances from the beds. The timber consists of pine, oak, chestnut, beech, poplar and ash.

All these advantages render the county a very inviting field for new settlers, who are always heartily welcomed.

### LANCASTER

was formed in 1651. It lies on the north bank of the Rappahannock river, where it debouches into Chesapeake Bay. Northumberland and Richmond counties bound it on the north. Area of the county, 81,087 acres, assessed at \$624,294. Population—white, 2,626; colored, 3,534; total, 6,160.

The surface is mostly level, with some rolling lands. The soil is a sandy and clay loam, producing good crops of corn, wheat, oats, vegetables and fruits.

It is drained by numerous creeks running from the interior of the county, tributaries of the Rappahannock river and of Chesapeake Bay. There are two steamers plying between Baltimore and Fredericksburg, which touch at various landings in this county four times a week; and one steamer between Baltimore and Piankatank touching at a wharf on Dymor's creek.

Ship and other timber and a large quantity of cord-wood is sold from this county, and immense quantities of oysters are shipped annually.

A large area, consisting of apples, peaches, pears, apricots, plums, &c., of this county is in orchards. Corn is the chief farm crop, but some of the lands produce large crops of wheat. With cheap and quick transportation to the cities north, this county is enabled to throw her early products on the market at the most propitious time.

The health of the county is good. Consumption is rarely heard of.

Our correspondent writes: "Within the last ten years a marked improvement is manifest in the general appearance of our county and I think equally so as to the prosperity of her people. New, comfortable and elegant dwellings have taken

the place of the humbler cottages. Commodious barns and other out houses and good fencing are seen almost every where. We have five villages with a number of large 2 and 3 story store houses doing fair business. Some six or eight factories where guano and oil are made from fish in large quantities, giving employment to many of our citizens and sailors and their vessels; some three or four canning factories; a seed farm owned by D. Landreth & Son, the great seedsmen of Philadelphia, which is worked in the most approved manner with all the appliances and machinery necessary, and produces many thousands of bushels of turnip seed and other farm and garden seed. I think there are no lands in Virginia which respond more promptly or profitably for the care and attention bestowed upon them than those of the lower Northern Neck. The average yield of wheat this year was very good and in almost every case it is followed by the best crop of clover perhaps ever seen here; many are making large crops of clover hay as well as clover seed. In this connection I refer to a neighbor who this year harvested 1,005 bushels of wheat from 25 acres of land; and from seed sown *last spring* has mowed 2½ tons of clover hay per acre, and expects to thresh a part of the second growth (now in blossom) for seed.

In addition to our river and steamboat means of transportation we expect soon to have a railroad from the city of Richmond to the Great Wicomico river. The depot for which has been secured as also the right of way for track, a part of which has been cleared and the whole line surveyed. When complete it will place us in 80 miles and 2 hours of our capital city, which now to reach requires about 24 hours and via Fredericksburg by steam 160 miles. Our public free school system seems to be working very well with good school houses and teachers for all children of school age, white and colored. Several new churches have been built and others in progress of erection.

The oyster fundum is a source of untold value and gives profitable employment to many of our citizens.

#### MATHEWS

was created in 1790 from Gloucester. It is 20 miles long, and at its widest section about 9 miles across—a peninsula, extending into Chesapeake Bay, united to the mainland by a narrow neck of land scarcely a mile wide—so that its boundaries are almost entirely of water.

It contains 54,288 acres, assessed at \$600,008. Population—white, 5,042; colored, 2,459; total, 7,501.

The surface of Mathews is almost a dead level—the soil light, easily worked and fertile. Corn, wheat, oats, grass (a correspondent says about 200 acres of grass produces from 1 to 2 tons per acre), fruits and vegetables are largely produced; and there is convenient and cheap transportation to Baltimore by steamers touching at the wharves. Mathews is famous for oysters and fish, which are a source of large revenue.

Owing to its almost insular position, Mathews is swept by salt breezes, and is said to be very healthy—a most desirable location for settlers. It may be remarked that Mathews is among the most thickly settled counties in the State (not reckoning cities), and the average assessment of lands is higher than in most of the counties of Tidewater. Only Elizabeth City, Norfolk, Alexandria and Accomack surpass it.

#### MATHEWS COUNTY MINERALS AT N. O. EXPOSITION, FROM COL. RICHARD LAMB.

1. *Grayish marl*, from Taliaferro farm, on Warehouse Creek.
2. Compact crystalline marl, from same locality as above.

## MIDDLESEX

was formed from Lancaster in 1875. It comprises a strip of land about 30 miles in length, with an average width of five miles, lying between the Rappahannock and Piankatank rivers. Contains 80,767 acres of land, assessed at \$468,152; value town lots, \$33,650. Population—white, 2,618; colored, 3,634; total, 6,252.

The whole county is underlaid with beds of miocene marl, which have been extensively used with great benefit to the soil. Some of this marl is a nearly pure carbonate of lime, analyzing 95 per cent.

On the rivers the elevation of the land is from ten to thirty feet above tidewater—a mile or two back it rises to a hundred feet or more. The soil, varying in texture from sandy loam to the stiffest clay, well drained, easily tilled, productive, and very improvable; being very convenient to market (there are lines of fine steamers on both rivers bordering the county—time to Baltimore eight hours, and freight low), Middlesex offers great inducements to truckers, fruit-growers and farmers.

Fish and oysters abound. There are several oyster and fish canneries and several fish fertilizer factories in the county.

Timber is abundant, cheap and of excellent quality, and there are many steam and water-mills in the county. In colonial times there were potteries here, there being beds of fine potter's clay.

Society is good, and the people will welcome immigrants. Lands are yet low-priced, but rising in value.

## MIDDLESEX MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Blue marl*—from Hon. Robt. Healy, Va. Dept. Agriculture.
2. *Shells, pebbles, &c.*—from Dr. J. Mason Evans, Va. Dept. Agriculture.

## NANSEMOND

lies on the west side of Norfolk, and, like that county, extends from the North Carolina line to Hampton Roads, being, in round numbers, 30 miles long by 19 wide. It is watered by the Nansemond river and other streams running into the James, and by tributaries of the Blackwater. Number of acres of land 256,289, assessed at \$1,370,919; value of town lots, \$540,341. Population—white, 7,728; colored, 8,175; total, 15,903.

The surface of Nansemond is nearly level—the soil a friable, sandy loam, a description of land now considered the best for general purposes, the most profitable to work on account of economy of cultivation and adaptability to a great variety of crops. Marl is abundant in the county, and is much used.

Peanuts and cotton, corn, oats, and vegetables of all sorts (truck) are the principal products of this thriving county. A large portion of the land is devoted to "trucking," easy access to market being furnished by the Nansemond river and the steamers plying thereon, and by railroads to Norfolk and Portsmouth (the Norfolk and Western, and the Seaboard and Roanoke. From these cities there is cheap and quick transportation daily to the great markets of the northern cities.

The potatoes of Nansemond have long been celebrated, and other vegetables grow in equal perfection and ripen early, especially melons, peas and tomatoes.

Fish and oysters abound. There is yet much fine timber in this county, mostly pine, cypress and juniper.

This is one of the most prosperous counties in Virginia, the people being industrious and ready to avail themselves of the many natural advantages with which Nansemond is blessed.

Suffolk, the county seat, is a busy and thriving town, the centre of a large local trade. It is connected with Norfolk and Portsmouth by railroads, as above mentioned, and by river navigation, and is the terminus of the Suffolk and Carolina railroad.

Suffolk was in 1885 visited with a heavy calamity—a fire which consumed much of the business part of the town—but the energy of this thrifty people has rapidly rebuilt their town and revived its prosperity.

#### NEW KENT

was formed in 1654 from York. It is 26 miles long and seven to nine miles broad, and contains 127,742 acres of land, assessed at \$407,360. Population—white, 2,275; colored, 3,232; total, 5,507.

This county, lying between the Pamunkey, York and Chickahominy rivers, has extensive and fertile bottom lands, with navigable streams on two sides. Two railroads furnish added facilities for access to market. The Richmond and York River railroad on the north, and the Chesapeake and Ohio railway in the southern part, are of convenient access to all parts of its territory, and bring it into close connection with all the trade centres of the country.

The soil is light and sandy in the interior, and varies from sandy to stiff clay on the river bottoms.

The productions are corn, wheat, oats, and early vegetables and potatoes (both sweet and Irish), for which latter the soil is well suited.

Marl is abundant and of excellent quality. That near St. Peter's church contains about 90 per cent. carbonate of lime, and has been successfully used on the lands and even for mortar in laying bricks.

The timber consists of oak, hickory, maple, dogwood, pine and other valuable trees. Much cord-wood and ship timber is annually marketed from this county.

The people are intelligent and cultivated, and are noted for their generous hospitality and sociability. Lands can be cheaply bought, the price varying from \$2 to \$20 per acre. It is a healthy county, with the exception of mild types of intermittent fevers easily controlled.

#### NEW KENT MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Phosphate rock*—from R. T. Lacy. Contains 23.20 per cent. phosphoric acid—Virginia Department of Agriculture.
2. *Iron ore*—from Virginia Agricultural Department.
3. *Green sand marl*—from J. P. Pearson, Tunstall's—from Virginia Department of Agriculture.
4. *Shell marl*—from Tunstall's—Virginia Department of Agriculture.
5. *Shell marl*—from near St. Peter's church—Va. Department of Agriculture.

#### NORFOLK

was formed in 1691 from Lower Norfolk. It is twenty-four miles long with a mean breadth of nineteen, and stretches from the North Carolina line to Hampton Roads in the north, with Elizabeth river and its branches penetrating every part. In the southwestern corner, partly in this county and partly in Nansemond, is the

celebrated "Dismal Swamp," which, lying higher than the surrounding country, furnishes an abundant supply of the purest water, which can be carried to the cities of Norfolk and Portsmouth.

The population of Norfolk county, including Norfolk city and Portsmouth, was in 1880, 58,942, but has much increased since. Number of acres of land, 241,914, assessed at \$1,360,831; value of town lots, \$677,320.

The surface of the county is level, the soil a sandy loam with clay sub-soil. Nature seems to have designed it for a great garden, and it is rapidly being utilized in that way. Gardens and trucking farms are spreading in every direction around Norfolk and Portsmouth—soil, climate, market facilities, all concurring to give an unexampled impetus to the trucking business. Other crops can be raised—corn, oats, peanuts and other field crops—but market gardening is found so much more profitable that all energies are being applied in this direction. Communication with all the great cities north of Virginia is now rapid and easy, and freights are cheap. The recent opening of the New York, Philadelphia and Norfolk railroad, shortening the time to the great markets by five hours, has given a great impetus to market gardening. Early vegetables and strawberries of the finest quality are shipped in immense quantities and bring a large amount of money into this county and those adjacent. Perishable fruits and vegetables can be gathered in the evening and placed in the New York market by sunrise next morning.

Lands are rapidly rising in value, and already very high in the vicinity of the cities.

Norfolk is celebrated for the excellence and quantity of the oysters and fish brought to its market, and for the abundance of game.

Norfolk and its twin sister, Portsmouth, are rapidly growing in importance. Lines of steamers to Baltimore, Philadelphia, New York and Boston, besides those running inland to Richmond, Smithfield, Newport News, and those across the bay to Cherrystone and Cape Charles City, and by the canal to Currituck, throng the fine harbor. The foreign trade of Norfolk, too, is considerable, and increasing, as Norfolk has become a great cotton port—the third in the Union. The population of this beautiful and thriving city is now about 25,000.

The Norfolk and Western railroad, the Seaboard and Roanoke, and the Norfolk and Carolina railroads terminate here, and the railroads to the popular sea-bathing places at Ocean View and Virginia Beach have made these places easily accessible and draw great numbers of people to Norfolk.

The city of Portsmouth is a port of entry and the county seat of Norfolk county. It is situate on the west bank of the Elizabeth river, opposite the city of Norfolk, with which it is connected by a steam ferry. It is the terminus of the Seaboard and Roanoke railroad, whose building and repair shops are located just without the city limits.

It has a population of eleven or twelve thousand and there is a suburban population of three or four thousand more.

Portsmouth is on level ground and is regularly laid out. The streets, for the most part, are wide and straight, and they are, in general, well paved. The buildings are substantial, and many of them are of modern design. The assessed value of real and personal property is three millions, eight hundred thousand dollars.

There are two banks, an insurance and banking company, three hotels, three academies of learning, twenty public and a number of private schools, one weekly and two daily newspapers, thirteen churches, one opera house, several public

halls and three manufactoryes of bricks. Portsmouth has a Board of Trade and Exchange, which meets at stated times.

The business is principally retail, but considerable wholesale trade is done in groceries, lumber and staves. The packing and shipping of oysters is an industry employing a large number of hands and involving considerable capital.

Being situated in the centre of the garden truck growing district of Virginia and near the sea, the markets are abundantly supplied with table delicacies from the land and the water, making the cost of living quite moderate.

The harbor is one of the best on the Atlantic coast and is accessible at all seasons of the year to vessels of the largest class.

Lines of steamers run to Boston, Providence, New York, Philadelphia, Baltimore, Washington, Richmond, and also to points south, and the city is connected by a railway system with the principal cities in the United States.

The health of Portsmouth is remarkably good. The percentage of pulmonary diseases is very small, and the mortality record shows a smaller death rate than that of most of the cities on the Atlantic seaboard.

In the southern part of the city is a United States navy yard—one of the largest and best equipped navy yards in the country—where employment is afforded to a large number of mechanics and clerks.

A great naval station and dry-dock of the United States is located here, and the largest ships can be accommodated in this fine harbor and dock.

The enterprise and public spirit of the people have kept pace with the development of their resources and of their commerce. Fine shell roads, radiating in sundry directions from Norfolk, have superseded the dirt roads that were used a few years ago.

No part of the country offers a more inviting field to enterprising and industrious settlers than does Norfolk county.

A correspondent sends a description of Norfolk county so graphic that I insert it almost entire, at the risk of some repetition.

This county is situated immediately on Hampton Roads, and occupies the entire basin of the Elizabeth river and its many navigable branches. It contains about five hundred square miles and a population of thirty thousand, exclusive of the cities of Norfolk and Portsmouth, both of which are in its geographic limits.

Its people are generally native Americans—mostly Virginians and Carolinians, with a good sprinkling of northern and western men settled here since the war between the States. In religion they are mostly Methodist and Baptist, there being thirty-nine churches for whites and about an equal number for the colored.

Of the churches for white sixteen are Methodist, thirteen Baptist, four "Christian," three Episcopalian and three Presbyterian.

There are sixty-nine public schools—thirty-five for white and thirty-four for colored—for the maintenance of which about twenty-five thousand dollars is annually appropriated.

This county is noted for the variety and fertility of its soil, and its adaptation to fruit and all kinds of farm and garden productions grown in this latitude. The northern and middle sections are especially adapted to the growing of trucks or garden vegetables and small fruits. This industry has grown in the last few years to immense proportions, as is demonstrated by the fact that about five million dollars worth of truck—including potatoes, cabbage, kale, peas, beans, beets, squash, cucumbers, melons, pears, berries, etc., etc.—are annually shipped from Norfolk to northern and western markets, and a very large proportion of these are grown in this county. And yet the business is only in its infancy, and thou-

sands of acres are waiting for capital or new settlers with capital to occupy and develop. In the southern section, while there is much land similar to the above in its adaptation to vegetable gardening, yet the larger portion is of a different character, consisting of a dark rich soil overlying a rich clay subsoil, which is capable of producing the most abundant crops of corn, oats, potatoes, clover, timothy, herds and other grasses. Lately the farmers of this section have turned their attention to grass and stock growing with more than satisfactory results. The writer has this season harvested two tons per acre of timothy and herds grass, from land which never had in fertilizing but one application of lime. The indications are that the time is not distant when this section will be noted for its fine stock and grass farms.

In addition to these natural advantages of soil, few people are blessed with such facilities for transporting and marketing their productions. Besides the advantages offered by the Elizabeth and Northwest rivers and their branches permeating every section, the county is intersected by two canals (the Chesapeake and Albemarle, and the Dismal Swamp) and six railroads (the Norfolk and Western, Norfolk Southern, Seaboard and Roanoke, Virginia Beach, Ocean View, and Western Branch), which, with her many shell turnpikes and roads, afford every farmer a depot or landing within two or three miles of his home, thus enabling him in a few hours to place his productions aboard some one of the many large steamers that leave Norfolk city daily for the New York, Philadelphia, Boston, Baltimore and Washington markets.

Besides the agricultural interests, the county has many other industries (outside of the cities of Norfolk and Portsmouth) worthy of mention. Among them we note—

1st. Lumber cutting and manufacturing, with an invested capital of eight hundred thousand dollars and twenty hundred employees, turning out annually 50,000,000 feet of sawed lumber, millions of cypress and juniper shingles, and thousands of pine, oak and cypress piles, together with immense quantities of white cedar cord-wood, which is shipped to the Manchester and New York cedar works for the manufacture of tubs, buckets and other woodware, the timber for which is largely drawn from the almost inexhaustible supply found in the great Dismal Swamp, which, with its picturesque lake, occupies the southwest corner of the county.

2d. Manufacturing of fertilizers—four establishments, with a capital of \$390,000 and two hundred employees.

3d. Fish and oyster catching and packing, with \$400,000 capital and two thousand employees.

4th. Brick making—capital \$40,000, one hundred and fifty employees.

5th. Miscellaneous, with several thousand employees, including the United States navy yard.

Therefore, in summing up, we can say to those who are seeking homes, that Norfolk county is located on one of the finest harbors in the world; is ten to twenty-five feet above sea level; is twelve or fifteen hour's ride by rail or steam-boat of New York, Philadelphia, Baltimore and Washington cities, and in two or three hours of the popular seaside resorts "Old Point Comfort," "Virginia Beach" and "Ocean View"; is well supplied with educational and religious advantages; is rich in the abundance and variety of its industries; is progressive in its material wealth, as is evidenced by the assessor's books which show an increase of nearly one hundred per cent. in the taxable values in the last ten years; is possessed of a mild climate and will compare in healthfulness with any

of the tidewater counties of the southern and middle States, and lastly, can furnish homes at prices ranging from ten to two hundred dollars per acre, according to quality and distance from the cities of Norfolk and Portsmouth.

#### NORFOLK COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

*Collected by Richard Lamb, C. & S. E., Norfolk, Va.*

1. *Peat*, from the Dismal Swamp.
2. *Swamp Soil*, from the Dismal Swamp.
3. *Swamp Soil*, from same; land produces<sup>50 to 60</sup> bushels corn per acre.
4. *Sandstone*, found 18 feet from surface in excavating for sewers.
5. *Clay and Brick Land Tiles*, made from same, from George Oldfield's brick-yard, near Norfolk.
6. *Giant Oyster Shell*, half of one, weighing 6 pounds, from eastern branch of Elizabeth river.
7. *Fossil Crab*, found 60 feet below the surface in excavating for dry-dock at U. S. Navy-yard, at Gosport.
8. *Singing Sand*, from deposit near Ocean View.
9. *Fossil Pine Wood*, nearly decomposed, found 10 feet below the surface in Norfolk city.
10. *Lime* burned from oyster shells.

#### NORTHUMBERLAND

is one of the five counties constituting the "Northern Neck," which lies between the Potomac and Rappahannock rivers and Chesapeake bay. Northumberland county was formed in 1648. It is 25 miles long and about 7 to 8 miles wide, and contains 117,769 acres, valued at \$864,765. Population—white, 4,446; colored, 3,483; total, 7,929. The surface is mostly level. The soil on the streams is a sandy loam, with clay sub-soil, and is very well adapted to wheat. The ridge lands have a light soil, and are generally thin, but easily improved. The farm crops are corn, wheat, oats and green vegetables for city consumption.

Our correspondent in this county writes, September 3d, 1886: "our lands produce clover luxuriantly. Recently the farmers have been saving clover seed, and there will be as much as twenty-five hundred or three thousand bushels of *seed saved this season.*"

Almost every part of the county is accessible to water transportation by the creeks and estuaries from the bay and Potomac, and the projected railroad from Richmond, the "Richmond and Chesapeake," is to have its terminus in this county, near the estuary of the Potomac, and the cities of Alexandria, Georgetown and Washington are largely supplied from this county with melons, fresh vegetables, oysters, fish, wild fowl and poultry. There are valuable fisheries in this county. "Fish chum," or the refuse from fish-oil factories, is largely used as a fertilizer here, as well as in many other counties of this section, especially on wheat, with marked benefit. A recent correspondent says there are at least 700 hands engaged in the fish business. Fish chum is shipped to Charleston and other places for making fertilizers. There are also several fertilizer manufactories in the county (which incorporate the phosphate rock with fish chum) with expensive steam machinery.

There are two marine railways on Wicomico river where vessels are built and

repaired with dispatch. Many hands are employed and a large capital invested in these enterprises.

Eight hundred to one thousand barrels of eggs and large quantities of turkeys are annually sent to market. Farmers are generally out of debt. The county levy is very low. There are only two bar-rooms in the county. This is a fine part of Virginia, and offers pleasant homes and good inducements to immigrants.

### PRINCESS ANNE

was formed in 1691 from Norfolk county, and lies on the Atlantic ocean and Chesapeake bay, extending south to the North Carolina line. Population—white, 5,123; colored, 4,262; total, 9,385; area, 159,392, assessed at \$1, 145,894; value of town lots, \$9,795.

The surface is level. The soil a sandy loam, resting on a yellow clay sub-soil, is easily tilled and is generally productive. The best lands are in Holland Swamp, Eastern Shore Swamp, and on Back bay.

The productions are corn, oats, potatoes, trucks and fruits. A large part of the county is devoted to truck farming, and great quantities of vegetables and fruits are annually shipped to the Northern markets. Labor commands from \$8 to \$12 per month. The shipments of fish, oysters and wild fowl from this county produce a very large revenue to the citizens of the county. The fisheries on Cape Henry beach, Lynnhaven bay and river are very valuable. Lynnhaven bay oysters are renowned for their size and fine flavor.

The timber consists of oak, pine, gum, cedar, cypress, elm, holly and persimmon. The "Seaboard district," comprising the northeast angle of the county, is perhaps the best timbered region of lower Virginia.

The transportation facilities are ample and convenient to all parts. The ocean front is about twenty-three miles in extent; Back bay and North river are both navigable, and comprise a great extent of water fronts in the southern part, while the northern portions have the Eastern Branch and Elizabeth river, Lynnhaven river and the bay shore. Besides these facilities for market by water, there is the Virginia Beach railroad from Norfolk, passing across the county to a beautiful and most attractive watering place, called "Virginia Beach," on the Atlantic shore.

With good lands, easily tilled, abundant supplies from the water, cheap and convenient access to market, and a climate both pleasant and salubrious, it would seem that here is a place where all should be prosperous and contented.

### PRINCE GEORGE

was formed in 1702 from Charles City. Population—white, 3,255; colored, 6,799; total, 10,054; area, 180,208 acres, valued at \$952,160; value of town lots, \$5,665.

The surface is generally level, and the soil on the rivers is very fine. Its north and northwest boundaries are formed by the James and Appomattox rivers, which give over forty miles of deep-water frontage to this county. The lands on these rivers are noted for fertility. Many broad and fertile bottoms are found on the numerous tributaries of these two rivers, on Blackwater river, and on the tributaries of Nottoway river in the southern portions.

The productions are wheat, corn, oats, hay, peanuts, cotton and tobacco. The light, warm lands of the southern portions of the county are well adapted to the peanut and cotton.

Marl of various sorts is abundant, and has been extensively used with good results. Near Coggins Point, and at other places, is found the valuable green sand marl; and this is the locality where the late Edmund Ruffin conducted many of his experiments in the use of marl and demonstrated its value.

The facilities for reaching market are convenient to all parts of this county, and are furnished by the navigable rivers alluded to above, and by the Norfolk and Western railroad, passing through the central portion, with a branch road from the city of Petersburg, near its western boundary, to City Point, at the confluence of the Appomattox and James, and by the Petersburg and Weldon railroad, a link in the great coast-line, which skirts the western border of this county from Petersburg to Rowanty creek. City Point is a shipping point of some consequence, with a sufficient depth of water at its wharves for the largest class of vessels, and was used as a base of supplies for the United States troops during the siege of Petersburg.

Much fine timber and cord-wood are shipped from this county to the North.

The lands of Prince George are well-adapted to fruit culture, especially the grape, and encouraging progress is being made in this direction. A valued correspondent, living in the vicinity of the courthouse, says: "I know of about 9 (nine) acres in vineyards between here and Petersburg. One party commenced about seven years ago, and has extended his vineyard to eight acres, and is making a great deal of money—has refused \$8,000 for his place that he gave \$1,500 for, and the vineyard has been the cause of it."

### RICHMOND

was formed in 1692 from old Rappahannock. Is thirty miles long and about seven miles wide. It lies on the north bank of Rappahannock river, which is navigable here for large vessels, and is watered by Rappahannock river, Moratico creek, Farnham creek, Totrisky creek, Rappahannock creek, Menokin creek, and others; water-power good and ample. The low grounds are very fertile, producing fine crops of corn, wheat, oats and vegetables. The upper or forest lands are rolling, and the soil is a light sandy loam with red clay subsoil, susceptible of a high state of improvement, and is worth, at present prices, from \$5 to \$20 per acre. The river along its front abounds in fish and oysters, the shad and herring fisheries being very productive and profitable. The oysters are of choice quality, as are the fish and wild fowl, and hundreds of thousands of dollars are brought to the county in exchange for these products.

Warsaw, the courthouse, is situated about the centre of the county, six miles from the river, and contains a population of about 300.

Population—white, 3,810; colored, 3,389; total, 7,199. Number of acres of land, 116,322, assessed at \$602,373.

There are 38,843 acres in timber of oak, hickory, chestnut, pine, cedar, walnut, poplar, dogwood and maple.

Acreage in wheat, 4,266; oats, 500; buckwheat, 75; potatoes, 200; clover, 2,133; orchard grass, 200; in orchard, 1,277—in apples, peaches, pears, plums, apricots and cherries.

This is reported to be a good grazing country. Sheep especially are found very profitable.

There are vast quantities of marl in this county, both blue and white marl, which has been used with good effect.

The winters are mild, cultivation of soil easy and cheap, living abundant and

easily obtained, and access to market very convenient. Altogether this is a very desirable county.

There is daily communication with Baltimore, Fredericksburg and Norfolk by a line of fine steamers, and the Richmond and Chesapeake railroad, now in course of construction, will pass through the county. Richmond county is out of debt and has a surplus in the treasury, while her public buildings, bridges and roads are kept in good repair. Good farm labor is to be had at \$8 to \$10 per month; mechanics, \$1.50 to \$2 per day. This is an improving section, and the people are prosperous and contented, as our correspondent well says.

### SOUTHAMPTON

was formed in 1784 from Isle of Wight. The surface is level and the soil productive. It is watered by Meherrin, Nottoway and Blackwater rivers, which furnish broad and fertile low-lands and a good supply of fish.

Population—white, 7,507; colored, 10,565; Indian, 22; total, 18,094. Number of acres of land, 373,376; assessed at \$1,701,734; value of town lots, \$14,404.

The principal productions are corn, cotton, peanuts, trucks and potatoes. Soil a light sandy loam, with red clay subsoil. Marl exists in the county, and has been used successfully, though not extensively. The Seaboard and Roanoke railroad runs through the southern portion of the county, and the Norfolk and Western passes near its northern limits. There is much valuable timber, as oak, pine, chestnut, &c.

Southampton is amongst the most thriving counties of this prosperous section of Virginia. The population is intelligent and industrious, and her principal staples—cotton and peanuts—skilfully handled, have brought much money into the community. This is the banner county in the State in the production of cotton, between five and six thousand bales being sent to market annually.

### SURRY

is one of the oldest counties in the State, being just opposite Jamestown, the cradle of the Colony. It has James river for its northern boundary, and the Blackwater for a portion of its southern, and contains 163,313 acres of land, valued at \$862,085.97; value of town lots, \$12,014. The population in 1880 was—white, 2,386; colored, 4,559; total, 7,395, now estimated at 8,500.

The lands are level and slightly rolling. The principal products are corn, wheat, oats, peanuts, lumber and fire wood for northern markets. About two-thirds of the county is in timber, principally pine, white oak, hickory, poplar, beech, walnut, persimmon, cypress, holly and the gums are found in abundance. Lands sell at from \$2 to \$20 per acre. Yield of principal crops without manuring—wheat 12 bushels per acre, oats 15, potatoes 75, peanuts 20 to 60, corn 15.

All kinds of fruits are cultivated with success. Among the orchards is that of the Old Dominion Fruit Growing Company on James river, consisting of 27,000 standard Bartlett pear trees. Though the crop was generally short this season, the company is said to have realized \$9,000 clear this year.

### CHURCHES AND SCHOOLS.

The county has twenty-two churches—three Episcopal, nine Methodist, eight Baptist and two Christian; and twenty-four public schools—fourteen white and ten colored—with an average session of six and one-half months.

## CLAREMONT COLONY.

Claremont, the eastern terminus of the Atlantic and Danville railroad, is a colony settled since 1880 by northern people. A northern capitalist bought the old Allen estate of 12,500 acres, and divided it into small farms. About three hundred families have settled there.

The town of Claremont, incorporated the last session of the legislature, now has about three hundred population, four hotels, two newspapers, two churches, and another being built, and some eighteen or twenty business houses, school-house, money order postoffice, two daily mails, two trains daily, and four lines of steamboats.

## RAILROADS.

The Atlantic and Danville railroad, to run from Danville to Claremont, a distance of 165 miles, has fifty-five miles in operation. The road will cross the counties of Greensville, Brunswick, Mecklenburg, Halifax and Pittsylvania, all of which, except the latter, have subscribed to its stock. Fourteen miles of the road is in Surry, and has increased the assessment of lands in that section of the county \$100,000 from 1880 to 1885. The company runs a steamer from its wharves at Claremont to Petersburg, a distance of fifty miles.

The Surry, Sussex and Southampton railroad, now building, will have its water terminus in this county, and twenty miles of its line will be in the county, passing through the county seat. About ten miles of this road are completed, and a large force of hands are now grading and laying track. By the first of November, 1886, all of the road in this county will be in operation.

\*The Surry Lumber Company has eleven miles of narrow gauge road connecting with the Atlantic and Danville railroad at Spring Grove.

The Surry and Smithfield railroad was chartered by the last legislature to run through the finest trucking section in the county to Smithfield in Isle of Wight county. When built it will open up a large section to market gardening for New York and Philadelphia markets.

Other shipping facilities are the James river, which forms the northeastern boundary of the county, on which ply daily the steamers of the Petersburg Steamboat company, the Virginia Steamboat company, the Old Dominion Steamboat and Excursion company, and the Steamer George Law, touching at all the wharves, of which there are six in the county; and the Norfolk and Western railroad, which passes on the southern side of the county.

## MARL.

Marl exists in great abundance and is very accessible. The table below will give an idea of its value as a fertilizer. Wherever applied it has never failed to produce most excellent results. All parts of the county near the river have it cropping out of the hillsides. Away from the river it is dug.

## Analysis of Miocene Marls.\*

LOCALITIES.	OBSERVATION.	Per ct. Carb. Lime.
Booth's Mill, Terrapin creek.	Yellow marl, shells in sandy clay, with a little green sand.....	32.7
Jos. Pretlow, Terrapin run...	Yellowish gray marl, shells in silicious sand, with little green sand.....	22.3
Blackwater, nr. Wall's bridge.	Shells in a yellow, sandy clay, considerable green sand.....	37.0
Three or four miles above } Four Mile tree..... }	Fragments of shells slightly mixed with green sand.....	47.2
Near Four Mile tree.....	Fragments of shells and undecomposed shells.....	88.6
Mr. Allen's Claremont.....	Yellowish white, fine and friable.....	71.5
Wakefield (Claremont).....	Light shells, generally decomposed—green sand, a trace.....	51.1
Claremont, (river shore).....	Blue, largely intermixed with green sand.....	10.2
Courthouse.....	Bank made up of shells and much green sand.....	72.9
Bacon's castle.....	White pulverulent.....	97.7

\* From Rulifn's "Calcareous Manures."

## SURRY COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. Yellow marl, from Blair Pegram—Va. Department of Agriculture.
2. *Serpula*, a mass of fossils from near Surry courthouse, from Richard Lamb, C. & S. E.

## SUSSEX

was formed in 1754 from Surry, the Blackwater river being the boundary between the two counties. By this river and its branches Sussex is watered in the northeastern parts, while the Nottoway meanders through the heart of the county, with many tributaries joining the main stream here.

Number of acres 301,877, assessed at \$1,027,193. Population—white, 3,361; colored, 6,701; total, 10,062.

The soil of Sussex, like that of the adjoining counties, is light in general, and is very productive on the streams. The crops for which it is best suited, and which are most cultivated, are peanuts, cotton, corn and oats. Marl is abundant, and has been used with very fine effect.

This county has fine railroad facilities, the "Norfolk and Western" passing through it in the northeast, the "Petersburg and Weldon" in the west, and the

"Atlantic and Danville" from northeast to southwest, through its largest diameter. The construction of the last-named road has given a great impetus to the business of the county.

### WARWICK,

now almost the smallest county in the State in area, and the smallest in population, was one of the eight original shires, and was densely peopled; there were in this little county six parishes. It contains 44,076 acres, assessed at \$437,857; value of town lots \$23,029.

The surface is level and the soil productive. The average yield of wheat is said to be 15 bushels, of corn 26, of oats 35 bushels—if so, it is far above the average of the State. The land is easily cultivated and very improvable—and there are large deposits of excellent marl. Fish, oysters and wild fowl are abundant.

The population of Warwick was, in 1880, only 2,264; but since that time the extension of the Chesapeake and Ohio railway to Newport News, in the southeastern angle of this county, has made an immense difference in the status of Warwick, Newport News having grown to be an important shipping point—resorted to by ocean steamers. This is, perhaps, the best coaling station on the continent—and there is here a grain elevator with a capacity of 1,500,000 bushels, and wharves on a grand scale, with depth of water to accommodate the largest ships that float.

### WARWICK COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

Case of bottles of borings from Artesian well, 630 feet deep, at Newport News. They represent the Quaternary and Tertiary beds of Virginia, and probably extend into the Jurasso Cretaceous: loaned by C. W. Smith, general manager of the Chesapeake and Ohio railway.

### WESTMORELAND

is bounded by Potomac and Rappahannock rivers, and counties of King George, Richmond and Northumberland. Average length thirty miles, width ten miles. Number of acres 142,896, assessed at \$872,644; value of town lots, \$36,935; population, 8,849.

The surface is generally level, but broken and hilly about the sources of the streams. Soil good, light loam resting upon red clay—in some sections the red clay reaches the surface. It is well watered; pure springs abound, and very good well water is in easy reach. Numerous tributaries of the Potomac penetrate inland for some miles, furnishing good steamboat navigation. Regular lines of boats give access almost daily to Washington and Baltimore. These inlets abound in oysters, fish and wild fowl.

A third of its surface is woodland. In many parts are found pine, four or five varieties of oak, hickory, cedar, chestnut, locust, poplar and gum. Valuable white oak is only found, however, in small detached parcels. Many orchards of fruit—peaches, apples and plum—are found. Corn, wheat and clover are the staple products. Winter oats are cultivated profitably. Potatoes, sweet and Irish, grow well. The soil is very fine for all varieties of vegetables, and trucking is increasing. Orchard grass and timothy are being introduced. Their cultivation, and raising clover seed for market, are decided successes. Good land yields from 10 to 35 bushels of wheat; from 25 to 50 bushels of corn; from one and a half to two tons hay.

The prices of land range from \$3 per acre up to \$30.

Good public schools, 22; several private schools; churches, 20—Baptist 9, Methodist 5, Episcopalian 6.

There is some immigration to this county, chiefly from the States; the population is homogeneous; society refined and cultivated; crimes of very rare occurrence; homicides almost unknown.

Lands are easy of cultivation; capable of sustaining a population ten times as numerous as that it now has. Manners of the people simple and unostentatious. Cost of living, owing to kindly soil and good climate, and abundant supply of oysters, crabs and fish from its waters, is perhaps as low as in any section of the Union.

Unbounded supplies of fertilizing material lie in large measure unused on every farm. Marl in many locations, marsh mud and oyster-shell lime are within easy reach of every industrious farmer.

Increased attention is being paid to sheep husbandry. Flocks of sheep average from \$2.50 up to \$6 per head of annual profit. Cattle do well—oxen often weigh 1,000 pounds at four or five years old, fed in winter upon dry fodder only, and then upon the natural grasses of the county.

The head streams of the estuaries or creeks afford fine water-power. Saw and grist-mills are found all through the county.

Men from any section coming to share our fortunes are gladly welcomed.—*Correspondent.*

## YORK.

This county, like its neighbor, Warwick, is one of the original shires of the colony. It is a long, narrow county, lying along the south bank of York river and extending to Chesapeake bay and the estuary of Back river, with a large water front and intersected by numerous tidal creeks. It contains 70,982 acres, assessed at \$564,104. Population—white, 2,837; colored, 4,512; total, 7,349. This county is abundantly supplied with fish, oysters and wild fowl. Deer and other game are plentiful, as indeed is to be said of the adjoining counties.

The surface of this region is generally level, the soil inclined to be sandy, easy of cultivation, productive when well managed, and responds readily to improvement. Marl is abundant, and tells wherever applied.

Corn, wheat, oats and peanuts have been the staple crops. Since the extension of the Chesapeake and Ohio railway, which skirts the southwestern edge of this county, much of the land has been brought into quick and easy communication with Newport News and the great markets of the North, and a more diversified style of farming is now rendered possible, and will soon be found to be very profitable.

### YORK COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Pectens*, scallop shells, bank of York river; Va. Dept. Agriculture.
2. *Marls, fossils*, corals, tertiary limestone cut into millstone, from bluffs of York river near Yorktown.

The following were collected by Richard Lamb, C. & S. E.:

3. *Miocene marl*, white, pulverulent, 90 per cent. lime carbonate, from near Yorktown.

4. *Clay and iron oxide*, massive, sub-crystalline, from "York Cliffs."

5. *Shells*, fossil and recent, from "York Cliffs."

## MIDDLE VIRGINIA.

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The next, as we go westward, is the "Middle Division," comprising the country from Tidewater to the low range of mountains parallel to the Blue Ridge and about twenty miles distant from it. This outlying range extends from Loudoun to Pittsylvania, with somewhat irregular intervals and direction, but with a general conformity to the course of the Blue Ridge.

It may be observed here that the respective limits of the "Grand Divisions" of the State assigned by various authorities are not positively defined, but vary according to the point of view from which the subject is regarded. For instance, Hotchkiss, subordinating other considerations to the geological formation of the country, assigns to "Middle Virginia" the four counties of Stafford, Prince William, Fairfax and Alexandria. They belong for the most part to the archaean or primary formation, although they skirt the Potomac and are intersected to some extent by tidal creeks.

For the latter reason, Maury assigns them to the Tidewater Division. Further south, the counties of Caroline and Hanover, which are assigned to the Tidewater Division, are in part in the archaean formation, and *vice versa* the county of Chesterfield, which is classed with the "Middle Division," has a tidal front of fifty miles on James and Appomattox rivers, and a considerable border of purely alluvial land; but by far the greater part of its territory is in the archaean, to which it is assigned. And the "low range of mountains" spoken of as making the line between Middle Virginia and Piedmont does not conform exactly with the county boundary lines, so that many of the counties have part of their territory overlapping the adjoining division; but they are properly assigned to the one in which the greater part is comprehended.

The classification of Hotchkiss will be adhered to here.

Thus reckoned, "Middle Virginia" consists of twenty-five counties, and contains between twelve and thirteen thousand square miles, or nearly a third of the State. As said, this is a primary formation, resting for the most part on granite and gneiss, but here and there on the new red sandstone, and the soil varies widely. Here is the great tobacco region of Virginia—the lands of the upper and lower jurassic period or new red sandstone being especially adapted to the finer qualities. This formation is identical with that of Lancaster county, Pa., and the lower Connecticut Valley, where the cultivation of seed leaf tobacco has enriched the community to an almost incredible degree. A strip of the former (the "upper jurassic") extends along the line of the Richmond, Fredericksburg and Potomac railroad almost its entire length. Considerable sections of the lower jurassic are found in Pittsylvania, Halifax, Campbell, Appomattox, Prince Edward, Cumberland, Buckingham, Albemarle, Chesterfield, Henrico, Orange, Culpeper, Fauquier, Loudoun, Prince William and Fairfax.

These older "Mesozoic" areas are aptly described by Hotchkiss in the Virginias as islands in the archæan region of Midland and Piedmont Virginia. Professor Fontaine says of them: "They are all situated east of the Blue Ridge, and most of them are found in the terrane of the crystalline azoic rocks. They lie in the eroded and upturned azoic strata, and are formed out of the material yielded by them. They lie in narrow strips isolated from each other, and seem to have been deposited in fresh, or at most, brackish water. Some of these areas were at some period in their history in the form of marshes, or had such a character as to permit the formation of an abundant vegetation and the accumulation of a considerable amount of coal. In Virginia, coal is found only in those areas that lie farthest east."

Those in which coal is found are the Richmond and the Cumberland areas. But it is of their value in an agricultural point of view that I would speak more particularly here—of their fitness for the production of choice tobacco. Much has been said of the unprofitableness of tobacco—of the sure and rapid impoverishment of the lands in which it is grown. That it has tended to produce that result, indirectly, is undeniable—but that this result is the necessary consequence of tobacco-raising is certainly not true. Even in Virginia, where the system is, or has been, of the very worst, instances can be shown of steady improvement of farms on which large crops of tobacco are grown—and, in the Northern States, whole communities can be pointed to as evidence that tobacco-growing does *not* necessarily exhaust the fertility of a country. There is, perhaps, no part of the United States more prosperous than Lancaster county, Pa.—the largest tobacco-growing county of the Union. Land there sells at prices almost fabulous, whenever, by any chance, it is put upon the market.

Other instances might be cited—in Connecticut, New York, Wisconsin. These people are prosperous because they believe in high farming—in getting large returns from the land, both in quantity of crop and in quality. The tobacco they make—the "seed-leaf," for cigar-wrappers—gives a heavy yield, and is eagerly sought after by buyers at prices that leave a large profit.

This digression is to the point in calling attention again to the important fact that these "islands," just described—these large "areas," scattered through Virginia—are of the same character of soil with the great county of Lancaster—that the *climate* of Virginia is as good for tobacco-growing—perhaps better—and that the land can be bought for a tenth—nay, a twentieth—of the price.

Middle Virginia is an undulating country—hills, table-lands and intervale—living springs and never-failing water courses everywhere. The soils **vary** greatly—the bottom lands generally very fertile, and the up-lands are often very productive, especially when the rocks contain epidote and some varieties of horn blonde.

The irregular limestone formation along the western borders of Middle and the eastern of Piedmont does not make a characteristic soil except in a few localities. Here and there the soils are exceedingly fertile, as in parts of Orange, Culpeper, and Loudoun, which counties are assigned to "Piedmont," although part of their territory belongs of right to the "Middle Division."

The productions of this region are varied. Tobacco has been mentioned as the staple of a large part of this division of the State, but its cultivation is by no means universal—in many counties it is not grown at all. Everywhere the cereals and fruits of temperate climates, notably the apple and grape, grow in perfection; and while we have not yet reached the grazing sections proper, we find clover, timothy, orchard and other grasses growing here and there in great luxuriance; and they show a natural adaptation to grass, which, however, so far from having

been encouraged, has persistently been thwarted—fought against—from the first settlement of the country until recently. “Killing grass” has been the object kept steadily in view in growing tobacco and Indian corn, and with the large force of slaves inhabiting this region, was so effectually done that it came to be believed by many that the valuable forage and pasture grasses would not grow here, despite the fact that “blue grass”—“*poa-compressa*” (the true “blue grass”—) the identical grass which is so highly valued in Fauquier and Loudoun for making fat pastures—is the grass which has given the planters most trouble to keep under, which has made such a struggle for existence that it has never been extirpated in this region; but, where it has half an opportunity, will assert its rights and will take possession of the land, crowding out wheat or whatever may, at the time, be in occupancy.

Clover has long been successfully grown here; and the idea that timothy, orchard grass, &c., would not succeed has been disproved by the logic of facts—there is scarcely a county in this region in which there are not meadows that would compare favorably with the best anywhere; few though they be, they demonstrate the possibility. The renovation of this healthful and most improvable region will be brought about by clothing a large portion of the country with meadow and pasture grasses.

#### FOREST GROWTH.

The “*Sylva*” gradually changes as we ascend from the Tidewater Division to Piedmont. The cypress disappears, the long-leaf pine ceases to grow after the first tier of counties is passed, and the cedar and holly, the gum and willow oak, become more and more infrequent. The short-leaf or hard yellow pine furnishes its valuable timber in every part of Middle Virginia, but does not take exclusive possession of large tracts of land as in Tidewater, except where it is found as “second growth” on lands which have been cultivated and then turned out to grow up again. There it takes the place of the genuine “loblolly” or old field pine of Tidewater—the long-leaf variety—the “*pinus taeda*” of Botanists. In the forests of Middle Virginia the pine (short-leaf, yellow, and two other varieties too rare to deserve a description) grows along with the various oaks, the tulip tree, hickory, walnut, locust, maple, ash and other timber of minor importance; and on the streams sycamore, beech, birch, willow and maple. At some distance from the mountains we again find chestnut in large quantities. In fine, the forest growth of this section is of singular variety, beauty and value.

#### MINERALS.

The mineral resources of this region are very great. Besides the coal of the mesozoic areas of Richmond and Farmville, heretofore alluded to, this country yields gold, silver, copper and iron ores in great variety and abundance, and for architectural purposes fine gray granite, gneiss and brown stone, Potomac or brecciated marble, and the finest slate for roofing purposes; also mica, kaolin and asbestos and limestone.

Sulphurets of iron are abundant in Louisa county and have been shipped in large quantities. They are rich in sulphur—one sample having analyzed 52.73 per cent.

Another deposit contained 43 per cent. of sulphur, and 5.89 per cent. of copper. These are found in that remarkable formation known as the “gold belt” of Virginia—a strip of land from fifteen to twenty miles in breadth, and running for two hundred miles through the State. The rocks of this belt are the slates, traps,

steatites, &c., of the primary, dipping at high angles, generally to the east. Interstratified with these are numerous veins of gold bearing quartz, magnetic, hematite, and specular iron ores, and the sulphurets of copper (and of iron) referred to.

Large amounts of gold have been taken from this belt—some of it from surface washings.

The veins of iron ore are numerous, some of the magnetic ores having a thickness of four feet; the beds of hematite ore, particularly those upon either border of the belt, as along James river, where it runs parallel with it, and in the "Wilderness," near the Rappahannock, are very thick and extensive. The first successful furnaces in America, those of the colonial Governor Spotswood, were supplied from the latter beds.

There are also large beds of this ore where the Chesapeake and Ohio railway crosses the belt. In this vicinity the valuable sulphurets of iron and copper are found, and there will soon be large sulphuric acid works and a manufactory of fertilizers here, turning out copper and iron as by-products.

The slates of the middle country are excellent for all purposes, notably those of Buckingham and Amherst counties. In Buckingham they have been long and extensively quarried for roofing, flagging, mantles, &c. The sandstone of the imposed "middle secondary" are valuable for building purposes, as are also the "brownstones" of the red sandstone, which are extensively quarried at Manassas. The infusorial earth, so abundant in Richmond, is valuable as a polishing material. Ochre of very fine quality is found in Chesterfield, near Bermuda Hundred, and is being shipped from that point.

#### RAILROADS.

This country is favored in respect of means of transportation, railroads penetrating it in every direction. The great "coast line," which passes through the State from Washington to Weldon close to the divide between Middle Virginia and Tidewater, almost on the line between the archæan and the tertiary formations—sometimes in one and sometimes in the other—belongs equally to both. From Washington and Alexandria ray out, the Washington, Ohio and Western, and the Virginia Midland, with its various branches; from Fredericksburg, the narrow gauge to Orange C. H.; from Richmond, the Chesapeake and Ohio stretches out through Henrico, Hanover and Louisa into Piedmont, and thence to the Ohio and beyond; and the Alleghany, along the beautiful valley of James river through Middle Virginia into Piedmont and Appalachia. The Richmond and Danville road penetrates this part of Virginia for a hundred and fifty miles before passing into North Carolina, and sends out a branch at Keysville and another at Sutherland. The Brighthope road from Bermuda Hundred taps the coal region at Clover Hill, twenty-odd miles away. At Petersburg, the Norfolk and Western road passes from Tidewater into Middle Virginia, and after a course of more than a hundred and twenty miles in this division, strikes out southwest through Piedmont and the Valley to the Tennessee line at Bristol. The "Atlantic and Danville" is in course of construction from the point to which it is now completed, Hicksford, in Greensville county, to Danville and beyond; and the southern link of the Virginia Midland extends from Lynchburg to Danville with a branch from Elba Station into Franklin county. All these roads intersect this division of Virginia, and there are others projected, and probably soon to be built.

## WATER.

This is marvellously well watered region—a land of living springs and perennial water-courses, rivers, creeks and brooks. The eastern edge of the belt has been described as “a granite rim rising some 200 feet above the tide waters, setting bounds to their further flow inward, furnishing fine water-power by the falling of the rivers over it, and sites for commercial and manufacturing towns. In every part of the “Middle Country” there is abundance of water—it would be hard to find a field in which there are not springs or brooks—and sites for mills are nowhere far to seek.

Most valuable mineral waters are found in this region. The lithia springs of “Buffalo,” in Mecklenburg, have long had a wide reputation, and the more recently discovered lithia and other springs near Farmville, and at “Wolftrap,” in Halifax, are rapidly becoming known throughout the country. The sulphur springs in Powhatan (Huguenot) and in Amelia were once much resorted to.

A recently discovered well at Chase city, in Mecklenburg county, where is a colony of Englishmen, furnishes a water which is said to have made some remarkable cures of dyspepsia.

## HEALTHFULNESS.

Except in limited localities in and near certain water courses, where malarial diseases prevail to some extent, this is an exceptionally healthy region, perhaps as favorable to longevity as any part of America—we might almost say “of the world.”

## MIDDLE VIRGINIA BY COUNTIES.

## GROUPING IN NATURAL SUB-DIVISIONS.

## COUNTIES.

## NORTHSIDE GROUP.

Potomac Basin.....	{ Fairfax. Alexandria. Prince William. Stafford.
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Pamunkey Basin.....	{ Spotsylvania. Louisa.
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James Basin.....	{ Fluvanna. Goochland.
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## SOUTHSIDE GROUP.

James-Appomattox Basin.....	{ Buckingham. Cumberland. Powhatan. Chesterfield. Appomattox.
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Appomattox Basin.....	{ Prince Edward. Amelia.
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Nottoway Basin.....	{ Dinwiddie. Nottoway.
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McCherrin Basin.....	{ Lunenburg. Brunswick. Greenville.
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Roanoke Basin.....	{ Campbell. Charlotte. Pittsylvania. Halifax. Mecklenburg.
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In the following brief description the counties are arranged in alphabetical order, as before, for convenience of reference.

## MIDDLE VIRGINIA BY COUNTIES.

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### ALEXANDRIA

was originally a part of Fairfax. Having been ceded to the General Government as a portion of the District of Columbia, and retroceded to Virginia in 1847, it was organized into a county. The area is very small, being only ten miles long and five miles wide, with 18,421 acres, assessed at \$796,578. The population, including Alexandria city, is 17,546—white, 9,972; colored, 7,574.

This county lies along the south bank of the Potomac river, with the District of Columbia, containing the Federal Capitol, Washington city, and Georgetown, on the opposite bank. The county seat is the very considerable town of Alexandria, on the Potomac, which has a population of about 14,000.

The commercial advantages of Alexandria city and county are unsurpassed, the facilities for shipping and means of access to market being all that could be desired. The river, here a mile wide, is navigable for the largest vessels, with a depth of thirty-five feet at the wharves.

Alexandria is admirably situated for manufacturing purposes, being near the mines of coal and iron and on a deep river. The Alexandria and Fredericksburg, Virginia Midland, Washington and Ohio, and Washington and Alexandria railroads all centre here, and the Alexandria canal, connecting with the Chesapeake and Ohio, forms a water line to Cumberland, 187 miles above; transportation is therefore cheap and expeditious. The decay of foreign trade, consequent upon its concentration through the influence of steam in a few great cities, has left a large number of warehouses unoccupied. These can be purchased or rented at very low rates for manufacturing purposes, and many of them have wharf privileges and a railroad in front of them. Clay for brick-making is abundant, and four extensive brick yards are now in successful operation; and there is an abundant supply of excellent sand for building purposes, while limestone is brought to the kilns very cheaply by the canal.

The city is being improved every year by the erection of a hundred or more buildings, many of them handsome brick ones, yet rents are low and lots cheap.

School facilities are excellent. Besides the public schools, which employ twenty-six teachers and educated last year 1,650 children in eight grades, there are more private schools for the population than in almost any city in the Union. I may name St. John's Academy, a military school, which had last year patronage from fourteen States and Territories; Potomac Academy, another flourishing institution for young men; St. Mary's Academy, Arlington Institute, Mount Vernon Institute, the Alexandria Female Seminary, and other excellent schools of high grade for young ladies, besides Catholic and Lutheran parish schools, and many private schools for children of both sexes.

Church accommodations are also abundant. There are five Methodist churches, three Episcopal, three Presbyterian, one Catholic, one Baptist and one Lutheran, a Friends' meeting house and Jewish synagogue, for white people, and seven Baptist, one Methodist and one Episcopal for colored—in all twenty-four places of worship, one for every six hundred people. The place is quiet and orderly, and its morality is decidedly above the average.

It has a very full supply of the finest and purest water, so pure that the reagents which blacken ordinary hydrant water elsewhere, do not affect its transparency, and its fire department is unexcelled in the country for its efficiency.

Its health is excellent; it has not suffered from any pestilence since the beginning of the century, even the cholera touching it very lightly in 1832, and passing it by in all its other visitations. One of the schools, with fifty students boarding in it, has had but two death, a teacher and a pupil, in more than half a century, and advertised one year that its physician's bills averaged but twenty-five cents to each student, at full rates.

Its nearness to Washington also adds to its advantages. There is communication by rail or boat every half hour during the day, and several trains up to midnight, at a cost almost nominal, so that the amusements and instructive collections of that beautiful city are always within easy reach.

The soil of this county is well suited for market gardens, and the proximity of Alexandria city and Washington give great advantages in this respect, and for dairy farming. Washington is rapidly becoming one of the greatest cities of the country, and lands in the vicinity are fast enhancing in value.

### AMELIA

was formed in 1734 from Prince George. It lies on the south bank of Appomattox river, which separates it from Chesterfield, Powhatan and Cumberland counties, and, together with its numerous tributaries, affords ample drainage and extensive bottom lands. The county is thirty miles long and about ten miles in mean breadth, and contains 223,945 acres of land, valued at \$907,731. Population, 10,377—white, 3,037; colored, 7,340.

The upland is gently undulating; the soil varies from red clay to gray slate and sandy loam, and produces good crops of tobacco, corn, wheat, oats, rye, grass, &c. Tobacco is the main money crop, and its production and curing are carried to great perfection by intelligent and careful planters.

Under the new order of things grass has been found to do exceedingly well in Amelia, and much more attention has been paid to its cultivation than formerly, greatly to the advantage of the farmers.

“Flue-curing” has been practised here for five years past, and it has been found that bright tobacco of the finest quality can be produced in Amelia. Commercial fertilizers, especially raw phosphates, are reported to act well and prove very remunerative here. Improved agricultural machinery is being introduced by enterprising farmers, and this bids fair to become again what it once was—one of the richest counties in the State, in proportion to population.

The Richmond and Danville railroad passes through the centre of the county, and the Norfolk and Western near its southeastern border. The Appomattox river on the northern edge is again opened for navigation, giving access to the markets of Petersburg.

“Amelia Courthouse is immediately on the line of the Richmond and Danville railroad, and is just thirty-six miles from Richmond. This is a growing village, with seven stores, a steam flouring mill, and other necessary branches of industry.

Jetersville, another village on the Richmond and Danville railroad, forty-three miles from Richmond, has four stores and other branches of business, and is a thriving place. These are the largest of the villages of the county.

"No county in the State has attracted immigration more than Amelia, owing doubtless to the cheapness of her lands (which range in price from two to twenty dollars per acre), and her accessibility to market and the outside world. A large number of English people have settled in Amelia, so that we have 'British colonies' once more in Virginia. There are several families of Hollanders, most of them in thriving circumstances. Michigan, Pennsylvania and New York are furnishing quite an immigration to this county, the former taking, however, largely the lead.

"The minerals of Amelia are various. Mica is very abundant, and mines have been successfully and profitably worked for some years past. In the vicinity of the county seat are the Rutherford, Jefferson and Pinchback mines. Others exist in the same locality, not yet in operation to any extent. Kaolin is obtained in great quantities in connection with the mica. A mine of steatite or soapstone is being successfully operated a few miles from the county seat. A soft yellow stone exists, which has been used for making a cheap paint. Coal exists in the eastern part of the county, but has not up to the present been mined. Some gold has also been found in the eastern section of the county. Mineral springs of decided value, both sulphur and lithia, exist.

"More attention is being paid to the roads and bridges of the county than heretofore, and several iron bridges have recently been constructed.

"The public schools of Amelia, growing in efficiency, compare most favorably with like schools in the State, and afford very fair facilities for a primary and business education.

"The colored race predominates in Amelia county, yielding a class of laborers for farming and other purposes cheaper and more constant than any to be found in the United States, if not in the world. The white and black races live in amity, and are mutually serviceable to each other."—*Correspondent*.

The following specimens were lent by Prof. Wm. M. Fontaine from his collection at the University of Virginia for the New Orleans Exposition :

1. *Potstone*, which is found in large quantities. Has been used for stove backs, in place of fire-brick, as it is a good material to resist heat. Was cut by the Indians into pots.

*Fragments of an old Indian pot*, cut from the above potstone.

3. *Zircon, Feldspar and Columbite*, from mica mines of Amelia.

4. *Amazon Stone*, which occurs occasionally in the feldspar of the Amelia mica mines.

5. *Albite Feldspar*, from Amelia mica mines.

6. Crystals of *Albite, Feldspar, Quartz and Mica*, from cavities in Amelia mica mines.

7. *Orthoclase Feldspar*, from Amelia mica mines; has been shipped for manufacture of porcelain.

8. *Albite Feldspar*, showing change of colors, from Amelia mica mines.

9. *Beryl Crystal*, fragment of a large one, from Amelia mica mines.

10. *Mica*, from Amelia mica mines.

11. *Monazite*, from same.

12. *Albite Feldspar with Spessartite Garnet*, from same.

The following from the Virginia Department of Agriculture :

13. *Mica*, from A. Rutherford, owner of Amelia mica mines.
14. *Mica*, Hall.
15. *Kaolin*, fine quality, from Amelia mica mines.
16. *Quartz*, glassy, from same.
17. *Feldspar*, from same.
18. *Amazon Stone*, from same.

The following rare specimens from the above mines were loaned by Professor W. M. Fontaine :

19. *Columbite Crystals*, a large mass.
20. *Microlite Crystals*, a large mass.
21. *Monozite*, a large crystalline mass.
22. *Monazite*, partly altered, a large crystalline mass.
23. *Microlite*, striated by overlapping plates of mica.
24. *Monazite*, aggregated crystals.
25. *Albite Feldspar*, crystals.
26. *Albite Feldspar, Spessarite and Helvite*.
27. *Allanite*, a variety of Orthite.

#### APPOMATTOX

was formed in 1845 from Buckingham, Prince Edward, Charlotte and Campbell counties. It is about 26 miles long and 18 miles wide, and contains 210,243 acres of land, valued at \$807,099; value of town lots, \$36,935. Population—white, 5,153; colored, 4,927; total, 10,080. It lies on the south bank of James river, and is well watered by tributaries of that river, by the Appomattox, and some of the tributaries of Staunton river.

The surface is rolling, and in some parts hilly, but the many streams give a large proportion of bottom land. The soil varies from a stiff red clay to gray slate of a light and friable texture. The productions are tobacco, grain and grass. Tobacco is as yet mainly relied on as the money crop, and as the soil is peculiarly suited to the production of fine "shipping," the county is noted for the high grade of this class of tobacco. The timber is abundant, and of valuable kinds—as oak, hickory, walnut, chestnut, maple, poplar, dogwood, &c.

The means of transportation to market are very good, and are afforded by the Norfolk and Western railroad passing through near the centre, and by the Richmond and Alleghany railroad, which skirts its northwestern border. This is a healthy and pleasant climate, where cheap and productive lands and agreeable surroundings furnish good inducements for new settlers.

The minerals of Appomattox are varied and valuable, to-wit: gold, iron, copper, manganese, steatite, mica, plumbago, asbestos, &c., and were represented in part at the

#### WORLD'S EXPOSITION AT NEW ORLEANS

by the following specimens :

1. *Limonite*, from Jones & Button's mine (Nuttall), one mile from Walker Ford station, Richmond and Alleghany railroad.
2. *Margarite*, a form of mica, from George P. Horner.

3. *Steatite*, from same.
4. *Magnetite*, from same.
5. *Limonite*, fibrous, from Wm. Drinkard, Stonewall creek, three miles from James river.
6. *Limonite*, from Thomas J. Stratton.
7. *Gold-bearing Quartz*, from George P. Horner.
8. *Specular Iron Ore*, from same.
9. *Manganese Ore*, from J. B. Moon.
10. *Specular Iron Ore*, from John J. Goff, Chestnut mountain.
11. *Limonite Iron Ore*, from E. M. Legrand, Chestnut mountain.
12. *Limestone*, from Mrs. Martha Walker, on James river.

The iron ores of Appomattox are almost unlimited in quantity, and are of immense value.

### BRUNSWICK

was formed in 1721 from Surry and Isle of Wight. It is nearly a square of about twenty-five miles on a side, and contains 356,892 acres, assessed at \$1,150,143. Population—white, 6,105; colored, 10,685; total, 16,790.

The surface of the county is undulating, and the lands are uncommonly well watered, having the Nottoway river on its north border, separating it from Dinwiddie and Nottoway counties, and the Meherrin and tributaries through the central parts, and tributaries of the Roanoke in the southern sections. The soil, is for the most part a sandy loam, easily worked, and very productive in wheat, corn, cotton, peanuts and tobacco. Gypsum is said to act well on these lands, and they are very responsive to commercial fertilizers. This county ranks third in the production of cotton—2,950 bales.

Many fine thoroughbred horses were formerly raised in Brunswick, this county being within the "race-horse" region referred to in the introduction.

The climate is mild and healthy.

The line of the Atlantic and Danville railroad has been surveyed through the heart of Brunswick, and will pass by Lawrenceville, the county seat, giving quick and easy transportation to market.

### BUCKINGHAM

was formed in 1761 from Albemarle; is thirty-five miles long and twenty-four miles wide, and contains 359,146 acres of land, assessed at \$1,347,830; value of town lots, \$155,885. Population, 15,540; white, 6,767; colored, 8,773.

It lies on the south bank of James river, which forms its boundary on two sides for nearly fifty miles. The broad bottom lands on this river are of unsurpassed fertility. Willis river, Slate river, and many smaller tributaries of the James, water this county, and the Appomattox forms part of the south boundary.

The surface is rolling and hilly, with several small mountains, as Willis, Slate river and Spears mountains. The soil varies from stiff red clay to a gray slaty texture, much of it very rich. The Slate river lands are very fine, and comprise a considerable area, the soil resembling that of the celebrated Green Spring lands of Louisa county.

The productions are tobacco, corn, wheat, oats, rye and grass. There is much fine tobacco produced in this county, and the planters are careful handlers of it. New varieties are being tried, and an effort made to improve the old kinds.

The timber found here consists of oak, chestnut, pine, hickory, &c., and is

abundant. This county is rich in minerals—iron, gold—of which many mines have been successfully worked for a great many years; barytes, slate, asbestos, mica and limestone. Slate of superior quality is mined near New Canton more extensively now than ever before, and is in great demand all over the country. To accommodate the demand for transportation of this slate, there has recently been built the Buckingham railroad, a branch from the Richmond and Alleghany railroad from Bremo Bluff station across the James, on a new and substantial bridge, to the slate quarries. The construction of the railroad and bridge here mentioned, and of several bridges at other points, is due to the enlightened policy of the authorities of the Richmond and Alleghany railroad, who are doing all in their power to develop the country through which it passes, and all which is tributary to it, the counties lying on the south bank as well as those on the northern. The main line of the road skirts the northern and western boundaries of Buckingham for nearly fifty miles, and affords means of transportation to market for the products of the greater part of the county.

The following (somewhat abridged) was taken from one of the papers in 1880; the writer was assessor of lands in the county, and has no interest in the mines: “Veins of gold, slate and iron enter the county just above New Canton, on James river, passing through the county. Slate is the leading vein, from a quarter to a half mile wide, inexhaustible as to quantity and most excellent in its character, and now largely worked.

“The gold vein is from two to fifteen feet wide on the west, and there is iron on the east in the greatest abundance.” \* \* \* \* \*

After describing and locating eight gold mines which have been opened and worked, he adds, “I am anxious to see the great mineral resources of this county developed, which are equal, as I believe, to the fabulous wealth of the Black Hills, of California itself. Then let capitalists and mineralogists and geologists come and examine for themselves.”

The celebrated Overman (Practical Mineralogy) says:

“We have here (in Virginia, &c.,) a belt of gold of unparalleled extent, immense width and undoubtedly reaching to the primitive rock. \* \* \* \* \*

“Here is a mass of precious metal enclosed in the rock which cannot be exhausted for ages; and in this respect the region in question is the most important of all known deposits, California not excepted.”—*The Virginias.*

Buckingham county was represented by the following

#### MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Roofing Slate*, from quarry of Edwards & Roberts, near New Canton.

2. *Steatite*, from two miles from mouth of Hardware river.

3. *Gold*, in quartz, from Morrow mine.

4. *Iron Ore*, from Bent Creek.

The following were collected by E. D. Fraser, Esq.:

5. *Kaolin*, from the land of M. C. Eleon.

6. *Quartz*, micaceous, from Willis Mountain.

7. *Gold*, in a molecular state, from land of T. H. Garnett, six miles south from the courthouse.

8. *Asbestos*, from Willis Mountain.

9. *Pyrite*, iron pyrites, from Willis Mountain.

10. Gold-bearing quartz, from “Morrow” mine.

11. *Magnetite*, magnetic iron ore, from land of Geo. H. Cox.

12. Steatite, from land of T. H. Garnett, Willis Mountain.
13. *Mineral*, from Willis Mountain.
14. *Cyanite*, from Willis Mountain.
15. *Schoil*, from Willis Mountain.
16. *Copper Ore*, from shaft 80 feet deep on Willis Mountain.
17. *Schorl*, &c., from Willis Mountain.
18. *Cyanite*, from Willis Mountain.
19. *Gneiss*, from Willis Mountain.
20. *Miraceous Sand Stone* from Willis Mountain.
21. *Gneiss with Cyanite*, from Willis Mountain.
22. *Quartz*, from Willis Mountain.
23. *Mica*, from Willis Mountain; surface indications abundant.
24. *Hemite Iron Ore*, from Willis Mountain, from land of T. H. Garnett.
25. *Quartz* crystalline, from near Willis Mountain.
26. *Quartz*, crystalline, from west of Willis Mountain.
27. *Quartz*, from Willis Mountain.
28. *Quartz*, crystalline, Mrs. T. H. Garnett's, west of Willis Mountain.
29. *Mineral* from Willis Mountain.
30. *Gneiss* from Woodson Cave, Willis Mountain.
31. *Ochrous Clay*, Willis Mountain.
32. *Micaceous Rock*, from Willis Mountain.
33. *Quartz* and *Schorl*, Willis Mountain.
34. *Zircon*, Willis Mountain; shows in great abundance.
35. *Garnets*, from Willis Mountain.
36. Quarts, crystalline, from Mrs. S. A. Hubard's, three miles east of Willis Mountain.
37. Schorl in quartz, from John A. Scruggs', half a mile west from Willis Mountain.
38. *Magnetite*, from land of N. B. Shepard, four miles northeast from Willis Mountain; in large amount.
39. *Magnetite*, from land of P. A. Hubard, two and a half miles north from Willis Mountain.
40. *Kaolin*, from Mrs. S. A. Hubard, three miles east from Willis Mountain.
41. *Magnetite*, from land of Richard Davis, twelve miles east from Buckingham Courthouse.
42. Hematite Iron Ore, from Mrs. S. A. Hubard.
43. Mica in quartz, one-half mile west from Willis Mountain.
44. *Pyrite*, Iron Pyrites, from land of Mrs. S. A. Hubard, three miles east from Willis Mountain.

### CAMPBELL

was formed in 1781 from Bedford. It is nearly a square of twenty-five miles to a side, and contains 335,098 acres of land, assessed at \$2,238,262, exclusive of Lynchburg; value of town lots, \$42,366. Population, including Lynchburg—white, 17,300; colored, 18,953; total, 36,253.

It lies on the south bank of James river, by tributaries of which, and by Otter and Falling rivers and other tributaries of the Staunton, it is well watered. These streams give to it any quantity of water power for manufacturing purposes.

The James and Staunton rivers, the first emptying into Chesapeake bay, and the latter into the Roanoke (which empties into the Albemarle Sound), afford

water transportation for a portion of the productions of this county; but much the larger portion goes by railroads. The Virginia Midland railroad traverses it from north to south; the Norfolk and Western runs through the northern section from east to west; and the Richmond and Alleghany on its north border, all combining to give this county peculiar advantages and facilities for markets in every direction.

The surface is rolling and hilly. The soil is fertile and particularly adapted to the production of fine, high priced tobacco, as well as grain and grass. Land is valued at from four to twenty dollars per acre, and much of it is worth a great deal more. There is an abundance of timber of the usual growth of this section, a large part of the area being clothed with the original forest trees. Lynchburg, situated on the banks of James river, in the northern end of the county, is the fourth town in importance in the State, and contained in 1880 a population of 15,959, which has greatly increased since. The three railways which traverse this county cross each other here, making it a fine centre of trade. There are in Lynchburg eight banks and banking houses, four newspapers, four fine hotels, ten churches, many public and private schools, seventy tobacco factories, and in the suburbs two rolling mills, three foundries, two large flour mills, two bark and extract manufactories, and numerous other enterprises.

The following is from a description furnished H. T. Leman, former school superintendent:

"The formation of Campbell belongs to the azoic period, and is based on granite, syenite and gneiss. Some fine specimens of granite lie in the northeastern portion of the county, on James river, furnishing the finest building rock; but the larger portion found in the county is syenite, from some of which good millstones are made. Through the middle of the county, running from east to west, and about two miles in width, there is a vein of "new red sandstone" overlying the original formation. This is found in laminae from three to six inches thick, smooth surface, and is much used for building chimneys. The surface is generally rugged. The ridges running through the county are high, in several instances reaching the dignity of mountains. The soil of the higher land is a light, thin, gravelly loam, not very productive of itself, but yielding good crops with a little aid from fertilizers. The finer kinds of tobacco, wheat, corn, oats and grass are the remunerative crops. A vein of some eight or ten thousand acres of red or chocolate land, extending northeast and southwest, furnishes a fine soil for wheat—equal to any in the State—and with the large area of alluvial bottom, places it among the most productive of the counties east of the mountains.

The minerals consist of several varieties of iron ore, manganese and steatite. Some valuable mines have been worked for a good many years—those lying on Stonewall and Falling creeks furnishing from eighty to eighty-four per cent. of peroxide of iron. Ore is found almost everywhere in the county, but has been more particularly developed on the line of the Virginia Midland railroad, where large deposits of manganese have also been discovered. Some of the steatite is of beautiful texture, and makes handsome and durable backs and jambs for fire places.

Timber is abundant and consists of hard yellow pine; white, black, red and chestnut oaks; poplar, locust, walnut, hickory, black gum, sweet gum—a magnificent tree, growing tall and straight, furnishing a fine lumber for cabinet work and hubs of wheels. The sour wood grows in great quantities on the ridges, does not attain much size and is only used for fire-wood, but twice a year ornaments

the forest with its beautiful lily-like flowers, and furnishes the bee with its purest honey.

Campbell had the following

MINERALS ON EXHIBITION AT THE NEW ORLEANS EXPOSITION.

1. *Cyanite*, from J. J. Hardwicke, Lynch station, Virginia Midland Railroad.
2. *Iron Ore*, specular and magnetic, from mine near Lynch station.
3. *Magnetic Iron Ore*, from mines of E. S. Lee, Otter river station, Virginia Midland Railroad.
4. *Manganese*, from mines of H. Oliver, near same locality as above.
5. *Barytes*, from "Hewitt" mine, near above locality.
6. *Steatite*, from Mrs. C. Peerman's quarry, near same locality.
7. *Marble*, from J. M. Burruss, near same.
8. *Manganese*, from mine of M. L. Bishop, near Lynch station.
9. *Magnetic and Specular Iron Ore*, from last mentioned mine.

The following were collected by Mr. E. D. Frazer :

10. *Iron Ore*, magnetic, from "Rosenberger" mine.
11. *Iron Ore*, specular and magnetic, B. S. Bernard's, near Lawyer's store.
12. *Iron Ore*, hematite, from "Mortimer" mine.
13. *Manganese*, from E. S. Moorman's, near Lawyer's.
14. *Manganese*, from "Carson" mine, four miles south from Lawyer's.
15. *Quartzite Marble*, from Lee mine.
16. *Quartzite Marble*, a slab, from Moon's quarry on Lee mine.
17. *Barytes*, ground, grade number one, from mills of Tanner, Bliss & Co., Lynchburg.
18. *Barytes*, ground, grade number two, from same firm—the mineral was mined in Campbell county.

CHARLOTTE

was formed in 1765 from Lunenburg. This county has 302,624 acres of land, with an assessed value of \$1,582,414. Population—white, 5,704; colored, 10,949; total, 16,553. The greater part of the county is watered by the Staunton and its tributaries, and some of the branches of the Meherrin have their sources in the eastern edge of Charlotte. There is much productive bottom land, and the soil is generally good, especially suited to fine tobacco as well as to cereals and grass. There was formerly much wealth in this county, and now its fine soil, abundant water-power, fine timber and healthy climate make it very desirable as a residence. Many settlers from the North have located here and are pleased with the country. The market facilities are good, the Danville railroad passing through the county, and the Mecklenburg branch from Keysville through the eastern edge; and the Staunton river is navigable for batteaux all along the southern and western frontier of the county. Five thousand dollars per annum is being expended by the general Government in extending and improving the navigation of this river, and a steamer is now running up to Cole's Ferry and as high as Brookneal.

Iron ore, copper, mica and kaolin have been found in Charlotte.

## CHESTERFIELD

was formed from Henrico in 1748. It is 28 miles long and 18 miles wide. The surface is rolling. The soil is in general light and gray in color, easily improved, and contains 297,719 acres, assessed at \$3,077,021; value of town lots, \$50,950. Population—white, 13,564; colored, 11,521; total, 25,085.

"Chesterfield county lies between James river on the north and the Appomattox on the south. It is intersected by a number of large streams. The county is divided into two unequal parts by the seam of granite which marks the limit of tidewater in all of the rivers of the State. The eastern and smaller section is therefore in Tidewater Virginia, and is adapted to all the crops of that section. The southern section, in addition to the cereals, vegetables, peanuts, &c., of the tidewater section, produces a good quality of tobacco.

"The lands along the James and Appomattox rivers, both above and below tidewater, are good, some of it being unsurpassed by any in the State. The historic farms of Drewry's Bluff, Presque Isle, and Bermuda Hundred, with many others just as productive, are on the James river below Richmond, and are certainly equal to any lands in Eastern Virginia. There are some fine farming lands on the large creeks. The high lands in many cases, though naturally good, have been worn down, and need improvement. As to game, we have all common to this section—deer, fox, rabbit, squirrel, raccoon, opossum, &c., with wild turkeys, partridges, and along the rivers ducks, geese, sora, &c. Our streams are well supplied with fish—all native to this section abound, and in tidewater streams sturgeon, shad, herring and terrapin in great abundance.

"The county lying as it does between Richmond and Petersburg, offers extraordinary inducements to the market gardener, to say nothing of the advantages of being in easy reach of the Northern markets by steamers on James river—at many of the wharves of which vessels can be freighted for foreign ports.

"Dairying is now in its infancy, but the ease with which grass can be grown on much of our river land and the proximity of two large cities will at no distant day make it an important industry.

"On the seam of granite above mentioned there are two large and one small quarries, the output of which is said to be equal to any in the country. There is room and facilities for unlimited enterprise in this direction.

"Ochre is being successfully worked on the Lower Appomattox, and gives employment to about one hundred hands. There are three cotton mills, giving employment to over six hundred hands; two large flour mills, and a large establishment for making doors, sash, blinds, &c., near Petersburg, employing a large number of hands; one steam tannery and one sumac mill employ a large force. The making of brick, tile, &c., is an important industry around Manchester and Petersburg.

"The Richmond coal-field, sometimes called the Chesterfield coal-field, runs across the county from north to south. Only the eastern crop has been worked within the limit of this county. At Midlothian the workings are in the hands of companies, independent of the railroad. At Clover Hill the Brighthope Railway company are working two large pits.

"In addition to the means of transportation furnished by the rivers, we have the Richmond and Danville railroad through the western part of the county, the Richmond and Petersburg railroad connecting those cities; the Brighthope Railway, running across the entire county, terminating at Bermuda Hundred, where

they have extensive coal yards, wharves, &c. There is also another road projected from Petersburg up the Appomattox. The Upper Appomattox is controlled by a navigation company, who are now rebuilding the dams and locks, which when done will afford the south side of the county ample means of transportation.

"The facilities afforded by the railroads, navigable rivers, &c., for shipping, has built up a very large industry in the cutting of wood and lumber for the Northern market. All kinds of timber can be utilized—gum, oak, pine, cedar, dogwood, and poplar. Even the cutting of hoop-poles, tobacco-box linings, &c., gives employment to many.

"All of the *little industries* fostered by the proximity of large cities have a place among our industries.

"As to wages, it goes without saying that they are about as high as the several industries can stand, for so many works of a public kind—as mines, factories, mills, railroads, &c.—compel the farmer to pay good wages or go without labor. The cotton mills not long ago adopted the ten-hour system, which is a new feature in this State at least.

"We have sixty-five public schools in the county, and are in easy reach of the best schools, both public and private, in the State, in the cities of Richmond and Petersburg. There is a large female school of high grade at Chester, on the Richmond and Petersburg railroad.

"Our county roads are fairly good, and are being rapidly improved. The Buckingham turnpike in the western part of the county, and the Richmond and Petersburg turnpike, running across the county, no longer charge tolls, but are still good roads.

"Chester, on the Richmond and Petersburg railroad, and Bon Air on the Richmond and Danville, are summer resorts for a class of people in the cities who wish to get their families to the country but cannot leave their business."

Another correspondent truly says of Chesterfield that "it is one of the best located counties in Virginia as regards markets and transportation, lying as it does between Richmond and Petersburg, having two large navigable rivers on its borders and being intersected with railroads." He goes on to say: "For outside markets we are only five hours from Washington, six hours from Baltimore, nine hours from Philadelphia and twelve hours from New York—the great markets of the country. For transportation, we have the James river on the north and east, the Appomattox river on the south and west; the Atlantic Coast Line intersecting the county north and south; the Richmond and Danville railroad running through the northern, and the Brighthope Railway through the central part of the county, making all parts easy of access and convenient to either railroad or water transportation.

"The farming interest of this county is rapidly undergoing a change through the energy and perseverance of our Northern and Western settlers, who, finding that they could not compete with the West in the cultivation of grain crops, have been seeding their meadow lands to grass, raising butter and milk for the three adjacent cities—Richmond and Manchester on the north and Petersburg on the south. Also, they are now planting vineyards, strawberries, and small fruits generally, several of our farmers realizing \$125 per acre on strawberries and \$150 per acre on grapes. It does not require very large tracts to make a family self-supporting.

"We have plenty of lands to the west of the Courthouse which can be yet bought at prices ranging from \$5 to \$10 per acre; south of the Courthouse from \$6 to \$12; east of the Courthouse from \$12 to \$50 per acre; on the north from \$10 to \$100 per acre. The lands adjoining the city of Manchester have nearly doubled

In value in the past twelve months, owing principally to the extension of the street railroad out beyond the corporate limits.

"Churches (principally of Baptist, Methodist, Presbyterian, and a few of other denominations) abundant, and convenient. Rapid progress has been made in developing the public school interest throughout the county.

"We have the cheapest rates of taxation of any county in the State. Lands are assessed below their real value, and yet taxes for all purposes only ninety cents on the \$100 worth of property. At this time the county has \$1,3,000 in bank and does not owe a cent.

"The remains of an ancient iron furnace are found in this county, five or six miles below Richmond, described by Berkeley in his History of Virginia as being worked in 1620. It was broken up by the massacre of Opecancanough in 1622."

#### CHESTERFIELD MINERALS AT NEW ORLEANS EXPOSITION.

1. *Bituminous Coal*, from Brighthope Railway Company's mines, from beds 25 feet thick.
2. *Glass Sand*, from Bermuda, near James river, very fine quality.
3. *Bituminous Coal*, from "Etna" mine, near Coalfield station, Richmond and Danville railroad.
4. *Carbonite, Natural Coke*, from "Eureka" coke mine, near same place.
5. *Crude Yellow Ochre*, from mines of Bermuda Ochre Co.
6. *Manufactured Yellow Ochre*, from above, considered by manufacturers equal to the best French.
7. *Iron Ore*, hematite, from 3 to 4 inches thick above the beds from which the ochre is obtained; makes good metallic paint; probably the ore used in the first iron works built in America.
8. *Granite*, from Old Dominion Granite Company's quarries on James river.

#### CUMBERLAND

was formed in 1748 from Goochland. It is thirty-two miles long and about ten miles broad, with the Appomattox river running on its south, the James on its north boundary, and Willis' river through its western part. The Norfolk and Western railroad runs through a portion of its southern border. The surface is undulating and the soil productive. Number of acres of land, 191,049, assessed at \$1,011,570; value of town lots, \$10,201. Population—white, 3,123; colored, 7,414; total, 10,537.

The products are tobacco, wheat, corn and oats. The cultivated grasses, particularly clover, succeed admirably on improved lands.

The soil is very good, with generally a red clay sub-soil, and is capable of being made very productive. The lands on the rivers are very fertile. No county in the State probably is more healthy than this, and the inhabitants have every reason to be satisfied with their homes, and persons seeking new homes will find many inducements here.

Cartersville, on the James river, is the principal village, and much of the produce of the county is shipped from this point by the Richmond and Alleghany railroad, which runs near the north border of this county on the opposite side of the river. A substantial bridge across the river at Cartersville places the farmers of the northern end of the county in easy reach of the railroad.

Coal is found in the county, but it is only used for furnaces and blacksmith's use. A most remarkable cluster of mineral springs has been discovered in this county

within a third of a mile from the town of Farmville. There are lithia, sulphur, chalybeate and magnesian waters flowing from the earth within a few yards of each other—a wonderful and beneficent freak of nature.

Our correspondent gives the following sketch :

“ Cumberland offers many natural and social advantages to those seeking homes in Midland Virginia. Whilst our lands are not all as fertile as the “delta of the Nile,” and no “fountain of youth” flows within our borders, we are blessed with a mild and healthful climate and a soil kind and productive, always responding promptly to diligent tilling and liberal fertilizing. The soil of this county is as varied as its products. Tenacious red clay abounds in almost every part of the county, peculiarly adapted to wheat and red clover, and yielding not unfrequently thirty bushels per acre of the former crop. Much of our land is of the light gray type, where the tobacco plant delights to thrive, producing often from 1,000 to 1,500 pounds per acre. Here is grown in highest perfection the far-famed shipping tobacco of Virginia. Along our rivers and creeks the rich alluvial bottom lands produce large crops of corn and oats. All of the cereals, garden vegetables and orchard fruits adapted to this latitude can be successfully and profitably grown here. Tobacco and wheat are the principal crops grown for market in the interior of the county, but when the Brighthope Railway is extended through Cumberland, connecting with the Richmond and Danville railroad on the east and the Norfolk and Western on the southwest, we will be in easy reach of the large markets of the State, when fruit culture, trucking and dairy farming will doubtless largely engage the attention of our people.

“ Our county has voted a liberal subscription to the stock of the Brighthope Railway, which if built will traverse the county for a distance of twenty-five or thirty miles, affording such facilities for travel and transportation as will greatly enhance the value of our lands, and contribute largely to the material prosperity of our people.

“ Our lands lie well for cultivation, are easily drained, and rarely so broken as not to be secured against washing, if hillside ditches are properly run. We have still much original growth in our forests, with an abundance of excellent building material. Saw and grist mills in every neighborhood, with church and school privileges as good as are to be found in most counties of the State. We have no improved highways; our dirt roads are very good in summer.

“ There have been no mineral discoveries in this county to excite attention. Some surface specimens of magnetic iron ore have been found, but no explorations made of any magnitude. Near the village of Ca Ira on Willis river a paint mine was discovered years ago, which could no doubt be worked profitably if cheap transportation were at hand.

“ The mineral springs known as the Farmville Lithia Springs are located in this county. The waters are highly prized for their medicinal virtues, and large shipments are daily made to distant States. This property is now under lease to a company of northern capitalists, who contemplate erecting a large hotel near the Springs and making it an attractive resort to invalids and pleasure-seekers.

“ Our lands are worth all the way from \$3 to \$30 per acre, depending on quality, location, &c. Many farms are in a high state of cultivation, with good fences, buildings, &c.; others are run down and “out at the heels,” for want of means to repair and improve, or lack of energy and industry on the part of the owners.

“ New industries have sprung up here since the war, such as the manufacture of sassafras oil and the gathering and curing for market the sumac leaves. These spontaneous products, that were formerly regarded as nuisances, are now con-

verted readily into money. Our vast pine forests that everywhere meet the eye will, I believe, be a source of profit at no very distant day. Many of our farmers are turning their attention to sheep husbandry, and find it highly remunerative. Sheep thrive here on the great variety of herbage, and are free from many diseases that prevail in some other States. They require but little feeding during our usually mild winters, and the mutton fattened on our native broomsedge is of excellent quality.

"As to the average yield of different grain crops I would say—of corn, 5 barrels per acre; wheat, 10 bushels; oats, 15 bushels; rye, 10 bushels. The average yield of tobacco I would put at 1,000 pounds per acre among the good planters; but so much is grown of late years on poor wornout lands, without proper fertilizing and judicious culture and attention, that the general average would have to be considerably reduced if we take into the count this class of tobacco-growers."

#### CUMBERLAND MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Iron Ore*, lean, from Lyon A. Agee.
2. *Iron Ore*, from Dr. J. M. Blanton, Farmville.
3. *Magnetite*, from Col. J. C. Wood, near Ca Ira.
4. *Lignite*, from Dr. J. M. Blanton, Farmville.

#### DINWIDDIE

was formed in 1752 from Prince George. The surface is in some parts undulating, but mostly level. The soil of the undulating portion is light clay loam, susceptible of the highest state of improvement. The Appomattox on the north boundary, and the Nottoway on the south, with their tributaries, give ample drainage to the county, with fertile bottom lands.

"The population, census of 1880, was, including the city of Petersburg, 32,870—white, 14,437; colored, 18,428. The area of the county is 295,046 acres—102,517 acres arable land and 192,529 acres in original and second growth forest, assessed at \$1,123,794.

"The staple productions are tobacco, corn, wheat and oats, while cotton, peanuts, potatoes, sweet and Irish, melons, and vegetables of every description grow well in this county. In the eastern portion of the county, and in the section near Petersburg, the farmers are engaged in trucking, and having easy shipping facilities large quantities of trucks and berries are shipped annually from the county. There is an abundance of marl in the eastern portion of the county, and has been used with very satisfactory results by the farmers who have tried it.

"All the clovers and grasses flourish well, and give fine crops of hay, when seeded on the improved lands on the creek and river bottoms and on newly cleared land. The large area of forestry consists of all the oaks, the hickory, ash, dogwood, walnut, elm, persimmon, poplar and pine, original and second growth.

"There is an almost inexhaustible supply of granite, of the finest quality, in the northeastern portion of the county. The quarries at Mayfield and Booth's have been worked a number of years, and experts declare that the stone taken from them is susceptible of the finest polish, and noted for its durable qualities. These quarries are close to the lines of transportation, and very accessible.

"Several veins of hematite, some of them of rich ore, and of magnetic iron ore crop out in different portions of the county. Coal is also found, but has not yet been explored.

"The city of Petersburg, in this county, is an important railroad centre, and a

large tobacco and cotton and wheat market. It has eight large tobacco factories, four cotton factories, five large flouring mills, a large trunk factory, and three factories for the manufacture of butter dishes, boxes, baskets and crates for fruit and berries. The material for all these manufactures exist already, or can be raised in Dinwiddie county. The population of Petersburg at this time is about 25,000. The Norfolk and Western railroad, from Norfolk to Bristol-Goodson, passes through the city and through the northern portion of this county for a distance of nearly thirty miles. They have handsome depot buildings and large machine shops in the city, and a branch road to City Point on the James. The Atlantic Coast Line passes through the city and along the eastern border of the county for ten miles. It has large depot buildings and machine shops in Petersburg.

"The Appomattox river has been dredged, and is navigable for small steamers and sailing vessels to Petersburg. The Upper Appomattox Canal Company have put their canal in good condition and have a full line of boats. This canal passes along the northern boundary of the county, and is a great convenience to the farmers and land owners of that section.

"Labor is abundant and comparatively cheap.

"The public school system is thoroughly well established in this county, with good, comfortable school buildings and a full and competent corps of teachers. The churches in the county are sixteen Methodist, two Episcopal, two Baptist, one Presbyterian, one Disciple and twelve colored Baptist.

"The Central Lunatic Asylum, one of the largest asylums in the United States for colored lunatics, is located at Mayfield in this county."

## FAIRFAX

was formed in 1742 from Prince William. It lies on the Potomac river, and adjoins Alexandria county. The county is watered by the Potomac and the Occoquan, and their tributaries.

The surface is generally rolling and the soil is a sandy and clay loam, and in some parts very fertile.

The population is 16,037—white, 10,773; colored, 5,264.

Number of acres of land, 264,035, assessed at \$2,075,003; value of town lots, \$490,524.

The productions, already very large, are rapidly increasing, and consist principally of corn, wheat, oats, rye, hay, fruits, dairy products and vegetables. Its proximity to Washington city, Georgetown and Alexandria, ensures a ready demand for all the productions of the farm, dairy and garden.

The land is mostly owned in small farms and is in a high state of cultivation.

Many families from the northern and western States have settled in this county since the war.

Artificial manures, lime and gypsum are in general use. Much of the soil is well adapted to grass.

Bees, sheep and poultry are reported to be profitable.

There are thirty vineyards, embracing one hundred acres. This interest and general fruit culture are rapidly being developed.

The courthouse is situated near the centre of the county, and is a thriving village. It was nearly destroyed by the ravages of the late war, but has long since recovered from that disaster.

Mt. Vernon, the home of Washington, is situated in this county, on the banks

of the Potomac river, eight miles below Alexandria. The grounds are in charge of the Mount Vernon Association, and are visited every year by thousands of persons from all parts of the world.

Soapstone, asbestos, copper and iron are found in Fairfax. The Theodora Copper Mine is in this county.

The transportation facilities of this county are unsurpassed. It is traversed by three railways, the "Alexandria and Fredericksburg," the "Virginia Midland," and the "Washington, Ohio and Western"; and the Potomac river, which bounds two of its sides, is navigable for large vessels as far as Washington.

On the Potomac are many valuable fisheries, from which shad, herring and other fish are caught in great numbers.

The dairy business is conducted on an extensive scale. The production of milk for the supply of the cities of Washington and Georgetown amounts to over 2,000 gallons daily. There are several butter and cheese factories.

The wheat crop of this county has also increased immensely. Where, a few years since, two threshers with horse power did all the work, from farm to farm, there are now six steam-power threshers employed. Improved self-binder harvesters are in use.

Great quantities of ship-timber, and poplar for paper pulp, have been shipped from this county.

Farmers are prosperous, and settlers are adding steadily to the population.

#### FAIRFAX COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Soapstone*, from Edward Fitzhugh.
2. *Iron ore*, from J. J. Ratchford, Vienna.
3. *Potter's clay*, from Edward Fitzhugh.
4. *Coal*, Jura-Trias.
5. *Lignite*, Jura-Trias; Vienna.
6. *Mica-schist*.
7. *Kaolin*, Edward Fitzhugh.
8. *Steatite*, cut into form of Bible, from Syke's property, near great falls of Potomac.

#### FLUVANNA

lies on the north bank of James river, and on the western edge of the Middle Division. Albemarle bounds it on the west, Louisa on the north and Goochland on the east. The Rivanna river, flowing from Albemarle and Greene counties, enters Fluvanna near the northwest corner and falls into the James at the southeastern angle of the county, where the thriving town of Columbia is situated. Hardware river flows through the southwestern limits of the county, and Byrd creek through the eastern. These large tributaries of the James, and many smaller streams, abundantly water the county, and greatly enhance its agricultural advantages.

Fluvanna contains 180,690 acres of land, assessed at \$845,878.\* Population, 10,802—white, 5,512; colored, 5,290.

The productions of this county are those common to this part of the Middle Division—wheat, corn, oats, rye, grass and tobacco. For the last-named crop, it has a special reputation, the "sun-cured" of Fluvanna having been renowned

\* The assessed value of the 180,690 acres of land was in 1880, \$1,287,930. The figures given above (845,878) show a reduction so great and valuation so far below that of the lands of an adjoining county which is apparently no better and which is no more prosperous—i.e., Goochland—that I can hardly refrain from suspecting that a clerical error has crept in.—*Commissioner of Agriculture.*

for several generations. The system of flue-curing has recently been introduced very successfully.

This was formerly one of the best timbered counties in Virginia, and much good timber yet remains in some sections—pine, oak, poplar, ash, walnut and hickory.

The mineral wealth of this county is very considerable. The great gold belt passes through, and much gold has been taken from different mines. The "Tellerium" is the oldest gold mine in Virginia, and the ore of this and other mines is, in places, very rich.

Iron ore, magnetic and brown hematite, has been found, and good specimens of copper ore, in the neighborhood of Palmyra, the county seat.

The Richmond and Alleghany railroad, passing through the southern border of Fluvanna, gives easy and quick communication with Richmond. To the central parts of the county the Rivanna canal and slackwater navigation in the Rivanna river afford facilities for shipping produce to Columbia, where it is taken by the railroad. Altogether, this region offers many attractions to settlers—cheap and productive lands, pleasant and salubrious climate, accessibility to market, and a moral, law-abiding population.

#### FLUVANNA COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Gold*, in sulphurets of iron and copper, from Wm. F. Kirtley, Belzora mine.
2. *Magnetic Iron Ore*, from L. R. Payne of Palmyra.
3. *Gold-bearing Quartz*, from lands of Eugene Payne, thirteen miles north from Columbia.

#### GOOCHLAND

was formed in 1727 from Henrico. It is thirty miles long and about ten miles wide. It lies on the north bank of the James river, in its entire length. The surface is undulating. The soil on the rivers and creeks is very rich; on the ridges not so good, but is easily improved and then very productive. It produces large crops of tobacco, corn, wheat, oats and hay. As fine timothy meadows can be shown as are in the United States. And now that this is a well established fact the area seeded in grass is fast increasing, and improved stock being introduced. Attention is being paid to the culture of the vine, to which much of the land is admirably adapted.

The population is 10,292—white, 4,058; colored, 6,234. Number of acres of land, 178,680, assessed at \$1,363,049.

Good land can be bought for \$12; on the ridges, from \$2 to \$5. The Richmond and Alleghany railroad, running through its length, forty-two miles by the windings of James river, furnishes transportation for the farm products. The health of the county is excellent. It is drained by several large and many small creeks, which empty into the James.

In this county are found gold, iron ore, copper and coal. There are seven gold mines and two coal mines in the county. The soil is a gray or chocolate loam, resting on a tenacious red clay subsoil, and is noted for its large and excellent crops of wheat. Many northern men have purchased lands and settled in this county, and are well pleased with it. Besides gold, iron and coal, several other minerals are found here, as granite, plumbago and asbestos. The county seat, near the centre of the county, is thirty miles from Richmond, and is a thriving village.

## GOOCHLAND COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

Furnished by Charles Willard, Superintendent, from eight veins on land of Tagus Mill and Mining Co.

Gold ores from "Hurse Vein," 16 inch thick, and assays from \$28 to \$40 per ton.

1. Specimen of outcrop.
2. Specimen from water level, fourteen feet deep.

## From Mary Vein.

3. Specimen of outcrop.
4. Specimen of open cut near surface—assay \$14.
5. Specimen from open cut 8' deep—assays, \$10; vein 12" thick.

## From Oak Hill Vein.

6. Specimen from 4' vein above water level.
7. Specimen from water level.
8. Specimen from below water-level—yield \$10; 6" to 12" thick.

## From Oak Hill Tunnel.

9. Sample of hanging wall 18" thick.
10. Section of vein next below 9.
11. Section of vein next below 10.
12. Section of vein next below 11.
13. Bottom of vein below 12.
14. Piece of boulder weighing forty pounds in a brown gravel vein under 13.

## The Young Shaft.

15. Laminated rock, from 70' below surface, from hanging wall of ledge 1,600 wide.
16. Layer of slate 6" between 15.
17. From 10" quartz vein in 16.

## The Fisher Vein.

18. Surface croppings.
19. From water level 14' down.
20. From bottom of vein, vein 20" thick, close to above foot wall—assays \$14 to \$20.

## West Vein in Gilmore Mine.

21. From 10' cut.
22. From 10' cut.

## The Main Vein.

23. From croppings on top of hill.
24. From 20' deep—assays from \$24 to \$42.

25. From 30' deep—assays from \$24 to \$42.
26. From 40' deep.
27. From 50' deep—assays from \$40 to \$75.
28. } From 60' deep. If concentrated and roasted will assay \$150 to \$200 gold,
29. } and about \$9 silver.
30. Sample of choice croppings, found everywhere along the course of veins.
31. Gold in sulphurets of iron and copper, from Wm. F. Kirtley, "Belzora" mine.
32. Gold-bearing quartz, "Fisher" mine.
33. *Talc, mica and plumbago*, from line of R. & A. R. R.

### GREENSVILLE

was formed in 1780 from Brunswick. It lies on the North Carolina line, and is one of the cotton and peanut producing counties.

The surface is level or gently rolling; the soil mostly a sandy loam, easily tilled and freely responding to ameliorating culture. The Nottoway river, on its north line, and Meherrin, which flows through its central parts, with their numerous affluents, drain its surface and furnish ample water-power and abundant supplies of fish.

The productions are varied and valuable, and include tobacco, corn, wheat, oats, cotton and peanuts. There are some stiff clay soils well-suited to wheat. Lands are cheap, and the people kind and hospitable. The climate and health are all that could be desired.

The transportation facilities are very good, and are furnished by the Petersburg and Weldon railroad, which traverses its greatest length near the middle, and by the Seaboard and Roanoke railroad, which is near its southeast corner. Two other railroads have been projected, which will greatly add to the commercial advantages of this and the adjoining counties. The Atlantic, Danville and Western road is already completed from Claremont, the deep-water terminus on the James river in Surry county, to Hicksford, the county-seat of Greensville.

Population 8,407; white, 2,757; colored, 5,650. Area, 186,676, assessed at \$684,939.

Many immigrants have settled here since the war, mostly from the Northern States and from Great Britain. The timber of this county is abundant and very valuable, and consists mainly of white oak, ash and pine. There is a tram road, nine miles long, on which steam cars are run, leading from the Petersburg railroad to a very fine body of white oak timber.

Marl is found in this county.

Our correspondent writes: "Poplar Mt., Greenville county, Va., September 3, 1886. In response to your circular of August 10th, let me say: I live in the northern part of the county and own a clay farm on the banks of Nottoway river. When I purchased here I was repeatedly told that I had settled on the poorest farm in the county. Now the luxuriant growth of all my crops will prove the contrary to any one who will take the trouble to see them. I keep about one hundred sheep, twelve cows, three horses and some ten head of young cattle. I harvested fifty-eight bushels of fall wheat from 2½ acres of land, and am now putting into a silo from this same land at the rate of at least 7 tons of green corn fodder per acre. By the way, let me say I think this ensilage business is a great Godsend to south-side Virginia. English grasses do not take well to our uplands, but we certainly can grow rye and corn fodder and millet in enormous quantities, and the expense to us poor farmers need not be very great. My silo is a twenty

feet square barn, drawn up to the end of the cow barn and boarded up and down inside with 12 feet boards. This is the third year that I am filling it. From 1½ to 2 inches of the outside is injured by the air coming through, but all within is sweet and good. I put some 10 cords of green wood on top for pressure, cut 4 feet long.

"I am more and more convinced that it does not pay our farmers to raise cotton. The uncultivated fields grow up in briars and sassafras for the want of sheep and other stock to browse them down. I think if the farmers, generally, would keep stock, cattle buyers from the big markets would come here. A few years since I was in Washington and happened to room with a cattle buyer; he said to me, 'I go beyond you into the valleys of Virginia, into Tennessee and Kentucky; I would much rather come to you, but I could not fill a car in a whole week; I must go where I can fill a car in twenty-four hours.'

"Such a land for grapes and all small fruits, such pure water and pure air, is not often found beneath the sun."

### HALIFAX

was formed in 1752 from Lunenburg. It is one of the largest and wealthiest counties in the State. It borders on the North Carolina line, with Pennsylvania on the west and Mecklenburg on the east. It lies in the heart of the finest tobacco growing section of the State, and its production of tobacco, wheat, corn and oats aggregates a very large amount. This county is remarkably well watered, the Staunton river skirting its entire northern and northwestern boundaries, with numerous tributaries penetrating the county, while the Dan, Hyco and Banister rivers penetrate the interior. The soil on these streams is of great fertility, producing large crops of grain year after year without rest or fertilizer. Much wealth and refinement exist here, though the wealthiest families lost heavily by the late war, as they did in all parts of the State; but this county was very largely slave-holding. The population is 33,588; white, 13,293; colored, 20,295. Acres of land, 518,527, assessed at \$3,517,652.

While not generally regarded as strictly a grass country, all the grasses do well on good land. Sheep raising is largely carried on with very handsome profit. The Richmond and Danville railroad traverses this county from northeast to southwest, by which route the county seat is 115 miles distant from Richmond. The town of South Boston, on the Richmond and Danville road, at one of the points where this road touches the Dan river, is rapidly growing in importance as a tobacco centre—building up a flourishing trade. The Lynchburg and Durham railroad, recently chartered, will traverse the county from north to south, and the Atlantic and Danville railroad will traverse the southern portion. Halifax has just voted a subscription of \$150,000 to the Lynchburg and Durham railroad, and the same amount to the extension of the Atlantic and Danville road from Hickford to Danville. When these roads are completed the county will have ample facilities for market in all its parts. Iron, copper, plumbago, manganese and mica are found in the county; and valuable lithia water is found at "Wolf Trap," on the Richmond and Danville road, and exported to all parts of the country.

Our correspondent writes: The health of the people is as good as that of any of the Piedmont counties, the doctor rarely being able to acquire more than a scanty subsistence where he depends upon his profession alone. The industry of the people is unsurpassed; constant attention to their own affairs renders them but little disposed to gossip or meddle with the affairs of others.

Closely confined at home during the week, they eagerly repair to the house of

God on the Sabbath, where, let us hope, they are as anxious to meet with the object of their worship as with their fellowmen. In truth, the people, in the main, are religious and devotional, as evinced in their marked interest in the Sabbath schools, numerous protracted meetings, and the great attention paid to the beauty and comfort of their churches. Even the colored people, imitating this praiseworthy example, are erecting houses of worship all over the county, which, in many instances, would compare favorably with those in which our fathers worshipped before the late "unpleasantness." Naturally this great interest in religion is leading our people to more than ordinary zeal in the cause of education; the outlook for the schools being better to-day than at any time since the inauguration of the public school system in this State, as manifested in the many good schools now in operation, and the great call for good teachers and good schools in every quarter of the county.

Planting, that is, the cultivation of tobacco, is the chief industry of the county, not because our lands are not adapted to the grain crop, but because the cultivation of tobacco has been far more remunerative than that of other crops. The lands upon our principal streams, including Birch creek, Hico and other streams, are as finely adapted to corn, wheat, clover and other cereals, as those of the valley or any other section of the State.

A very large proportion of the ridge lands of the county is of a free, soft, gray sandy character, unsurpassed by any in the world for the growth of fine tobacco. Of such fine texture, silkiness, brightness and richness of color is the article sometimes grown here, as to bring upon the market more than a dollar a pound, and whole crops have been sold at the barn door at an average of forty cents, and sometimes even more. What makes this county peculiarly attractive is the fact, that while its grain lands compare favorably in fertility with those of any other section of the State, its poorest lands, such as have just been described, are its most valuable, selling sometimes as high as thirty and thirty-five dollars per acre. In fact, until the recent universal depression in trade, there was a considerable boom in the price of lands all over the county—in some instances bringing double what they sold for six or seven years ago—while this upward tendency in prices has been checked, we still believe with one or two more good crops we will reach a degree of prosperity which has not been experienced since the war. A sufficiency of good desirable labor can be had at prices varying from seven to ten dollars per month in the different sections of the county. Very desirable land can be bought at prices varying from eight to fifteen dollars per acre. Tobacco ordinarily sells at an average of from ten to fifteen dollars, as shown in the warehouse reports, but prices during the present depression range considerably lower. The price of grain here is, in a great measure, controlled by that of the Western and Northwestern markets. Corn, usually from 55 to 65; wheat, from 75 cents to \$1.25 per bushel; oats, hay, &c., from 75 cents to \$1.25 per 100 weight. Along the line of the railroad, Sutherlin, News Ferry, South Boston, Scottsburg and Clover, are enterprising business places. South Boston particularly has flourished beyond the expectation of its most sanguine friends. Blackwalnut, Brooklyn and Republican Grove, somewhat remote from the railroad, exhibit evidences of prosperity. Halifax before the war was one of the largest slave-holding counties of the State. At the close of the war many of the citizens were so heavily depressed with indebtedness arising out of the system of slavery that they have not yet recuperated—but for this fact, the county would to-day exhibit greater evidences of thrift than at any period of its history; for many in all parts of the county who were penniless, taking an even start, unhampered by debt, are

now possessed of good lands, comfortable houses and furniture, fine teams, and even pleasure horses and carriages, with money lying to their credit in the banks.

#### HALIFAX COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Cinder*, from ancient furnace near Scottsburg.
2. *Magnetite*, from John M. Jordan.
3. *Steatite and Clay*, from Wolf Trap—H. Blair.
4. *Light Sandstone*, from same as above.
5. *Magnetite and Specular Iron Ore*, from J. M. Jordan.

#### LOUISA

was formed from Hanover in 1742. It is thirty miles long and about eighteen miles wide, and contains 315,746 acres of land, valued at \$1,814,998, and a population of 18,942; white 7,409; colored, 11,533. North Anna river forms its northern boundary, separating it from Spotsylvania; the South Anna drains its central parts, and these rivers with their tributaries furnish much valuable bottom land and numerous sites for mills with abundant water-power.

The surface is gently undulating, and the soil in most parts of an excellent quality. In the western part of this county is a remarkably productive district of land called "Green Springs," supposed to be the bed of an ancient lake. The main crops of the county are corn, wheat, oats and tobacco, the last the main money crop, and being well handled, usually brings very good prices. Three hundred and seventy-five dollars per hundred weight was paid in 1885 for sun-cured tobacco raised in Louisa.

Transportation to market is furnished by the Chesapeake and Ohio railroad, which traverses it from east to west, and a branch of the Virginia Midland railroad skirting the western end.

The county is rich in minerals. Gold, silver, copper, iron, lead, manganese, kaolin and plumbago, all are found here. The inexhaustible deposits of copper and iron pyrites will one day be immensely valuable. Very soon they will be largely utilized in the manufacture of sulphuric acid, with the metal as a by-product. These rich deposits are found on the edge of the gold belt, near Tolersville, on the Chesapeake and Ohio railroad, and a branch road will soon be constructed to the mines.

Timber of the usual varieties found in Middle Virginia is abundant in Louisa.

#### LOUISA COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

The following valuable contribution, six boxes full, are from the "Arminius" copper mine, east from Tolersville station, Chesapeake and Ohio railway, contributed by W. H. Adams, engineer and mine manager:

1. *Granular Pyrites*, from surface of vein; contains about fifty per cent. of sulphur.
2. *Granular Pyrites*, from principal vein; sulphur, 49.57; iron, 43.62; copper, 1.50.
3. *Iron Pyrites*, containing gold, silver, &c.
4. *Iron Pyrites*, containing copper, gold and silver.
5. *Iron Pyrites*, containing copper. Analysis gives copper 3. to 12.; iron, 38. to 43.; sulphur, 34. to 42.
6. *Massive Iron Pyrites*, containing zin .

7. *Black Oxides of Copper*, "flnes"; copper, 4. to 20.; sulphur, 20. to 32.; iron, 20. to 28.
8. *Massive Hard White Iron Pyrites*; sulphur, 51.649; iron, 46.870.
9. *Granular White Iron Pyrites*; sulphur, 51.30; iron, 47.60.
10. *Pyrrhotite and Chalcopyrite*; copper, 4.207; iron, 45.; sulphur, 39.
11. *White Iron Pyrites*; millions of tons of ore carrying above 30 per cent. of sulphur and rich in copper and iron are here exposed on line of pits for nearly a mile in a northeast and southwest direction—much of it contains from 50 to 52 per cent. of sulphur.
12. *Garnet Slate and Garnets in place*, from main Pyrites vein in No. 3 shaft.
13. *Garnets and Magnetite*, crystals in place, from No. 1 shaft, 125' from surface.
14. *Manganiferous Iron Ore*, from a prospecting hole.
15. *Iron Ore, Hematite*, from surface of pyrites veins of "Arminius" and "Sulphur Mines" companies' properties. These ores have been largely used in Victoria furnace.
16. *Gold*, in sulphurets of iron and copper, from Wm. F. Kirtly, Esq.

The following from Professor Fontaine :

17. *Gneiss*, in large quantities, at Holliday's mill on North Anna river.
18. *Itacolumite*, from the "gold belt" near Tolersville, a little east from the pyrites.
19. *Specular Iron Ore*, from "Green Springs" neighborhood; not seen in place.

From the Virginia Department of Agriculture :

20. *Red Hematite Iron Ore*, from J. F. Jordan, from Old Victoria furnace.
21. *Micaceous Iron Ore*, from "Davis" mine, near Tolersville.
22. *Iron Ore*, from R. M. Kent, Louisa Courthouse.
23. *Gold-bearing Quartz*, from "Walton" mine.
24. *Manganese*, from J. B. Jenkins, Victoria furnace.
25. *Black-Jack Iron Ore*, from J. F. Jordan, Victoria furnace.
26. *Graphite*, from Mr. Powell.
27. *Gold-bearing Quartz*, said to contain \$2,000 to the ton, from J. B. Jenkins.
28. *Magnetic Iron Ore*.

Our correspondent writes cheerfully concerning this prosperous county. He says, after speaking of the fine oxen and sheep raised in Louisa and the tobacco of unsurpassed quality, and the excellent church and school privileges :

"Our people are public-spirited. The county roads are receiving extra attention. At this time twenty-five convicts are at work upon them, and making marked improvements. These things are showing themselves in the advancing price of farming lands, ranging from \$5 to \$35 per acre. Recently several farms have been purchased by gentlemen of wealth and culture. Stock raising and grazing are specialties with some of the farmers; and our farmers raise their own meat and bread."

#### LUNENBURG

was formed in 1746 from Brunswick. It is thirty miles long in its greatest length, and has an average width of about fifteen miles. It contains 269,287 acres land;

valued at \$682,409; value of town lots, \$4,445. Population—white, 4,611; colored, 6,924; total, 11,535. The surface is level, or gently undulating; the soil a grayish slate, or of sandy texture, easily tilled, and producing good crops. It lies between Nottoway and Meherrin rivers, the first forming most of the northern border, and the latter separating it from Mecklenburg on the south. The numerous tributaries of these rivers permeate the county in all parts and afford many eligible locations for mill sites.

The productions are tobacco, wheat, corn, oats, cotton and grass.

This county abounds in good timber of white and other oaks, pine, hickory, walnut and maple. No valuable minerals have been developed, but there were on exhibition at the New Orleans Exposition samples of glass sand, quartz and pyrite.

The transportation facilities of this county are not very good. The Richmond and Danville railroad passes along the northwest border, and the Richmond and Mecklenburg railroad on the west line.

This is a healthy region, and well adapted to fruits and the vine. The society is excellent, and the lands can be bought very low.

### MECKLENBURG

was formed in 1764 from Lunenburg. It is thirty-six miles long and has an average width of about eighteen miles. It contains 417,394 acres, valued at \$1,365,364; value of town lots, \$184,887. Population—white, 8,222; colored, 16,388; total, 24,610. It is watered by Meherrin river, which separates it on the north from Lunenburg, by the Roanoke, which runs from west to east through the southern portions, and by numerous tributaries of these rivers. The Dan and Staunton unite in this county and form the Roanoke. Upon these fine rivers there is a very large extent of rich bottom land—few counties in the State have more.

The productions are tobacco, corn, wheat, oats, and some cotton. About one half of the county is in timber, consisting of various kinds of oak, poplar, ash, hickory, beech, birch, pine, gum, dogwood, &c. Fruits succeed well, there being eight to ten thousand acres in apples, peaches, pears, cherries, quinces, plums and apricots, and a considerable amount in grapes.

The health of this county is excellent and the society good. Many immigrants have adopted this as their home, and there is room and inducements for many more. "Chase City," founded by English immigrants, is a flourishing colony, and the people are anxious to secure more of such a desirable class of settlers. The Buffalo Lithia Springs in this county has a world wide reputation as furnishing a mineral water of value in the treatment of dyspepsia, rheumatism and diseases of the urinary organs; and at Chase City a mineral water has been discovered which may prove very valuable.

This county has been greatly benefitted by the completion of the Richmond and Mecklenburg railroad from Keysville, a point on the Richmond and Danville railroad, to Clarksville, nearly across the western end of the county, and a movement is being made to extend this road to Durham, in North Carolina.

The Atlantic, Danville and Western narrow gauge road, which has already reached Hicksford, in Greensville, will pass through Mecklenburg, from east to west.

Gold has been mined in this county, and there are good indications of copper and iron. Slate and porphyry also are found here.

## NOTTOWAY

was formed in 1788 from Amelia. It is twenty miles long by about twelve miles in width, and contains 196,557 acres of lands, valued at \$726,331; value of town lots, \$92,781.

Population, 11,156—white, 3,012; colored, 8,144.

This was formerly a very wealthy county, and contained a larger proportion of blacks than any other in the State—about five-sevenths of the whole, or two and a half blacks to one white. Consequently there has been a great shrinkage of value in real estate, and there is an excellent chance to buy fine lands in this and other counties of the “black belt” at a low price. It is watered by Nottoway and Little Nottoway rivers and by some of the tributaries of the Appomattox.

The principal crops are tobacco, wheat, corn and oats. The tobacco of this county is noted for its excellent quality. The timber consists mostly of oak, pine, hickory, maple, walnut, beech, poplar, ash, gum, cedar, dogwood. Mica, steatite, kaolin, and granite are found in this county, but have not as yet been developed.

Blackstone is the largest village in the county. Beginning at the close of the war with one shanty for a storehouse, it now has over twenty stores and shops, one bank, one fertilizer factory, one bark, sumac and grist mill, one tobacco factory, two tobacco warehouses, three churches, public school building, etc. It ships more produce on the Norfolk and Western railroad than any station between Petersburg and Lynchburg.

Burkeville is a thriving village, located in the western part at the intersection of the Norfolk and Western, and the Richmond and Danville railroads. These two railways, entering the county one on the western and the other on the northern border, afford convenient transportation to most of its territory. This, with other counties of Middle Virginia, constitute probably the healthiest region of the State, and the people are hospitable and ready to welcome new settlers among them.

## NOTTOWAY COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Collection of Virginia Department of Agriculture.

1. *Steatite*, from Courthouse—J. R. Tuggle.
2. *Kaolin*, from Blackstone—C. Hadder.
3. *Fine Granite*, near Burkeville, used when railroads were built.

## PITTSYLVANIA

was formed from Halifax in 1767. It is thirty-five miles long and about twenty-six wide, and is the third county in area in the State. It contains 518,429 acres, valued at \$3,977,645; value of town lots, \$118,230. Population, including the city of Danville, 52,580—white, 25,389; colored, 27,203.

It is bounded on the north by Staunton river, and has Bannister and Dan rivers through the central and southern parts. These rivers and their tributary streams afford abundant water power and much fertile bottom land. The surface is rolling and hilly, with some low mountains. The soil is light gray and gravelly on the hills, while the low lands along the streams vary from a stiff red to a light, friable, sandy texture, and are very fertile. Tobacco, corn, wheat, oats, rye and the grasses are the chief farm products. The tobacco raised in Pittsylvania is largely of the bright, high priced kind, and is the main money crop.

Danville is one of the chief tobacco marts of the State, and is a growing city, with many large manufacturing industries, and an important railroad centre. It is located on Dan river near the southern end of the county, and is the terminus of four railroads.

All parts of this county have convenient access to market by railroads crossing its territory. The Richmond and Danville enters from its eastern border, the Virginia Midland from the north traversing its greatest length, and the Danville and New River from the western line—all centre in the town of Danville. The Pittsylvania and Franklin railroad from Rocky Mount to Elba, on the line of the Midland railroad, taps a fine agricultural and mineral region in the northwest part of the county, and now that large subscriptions have been made by the counties through which it is pass, the completion of the Atlantic and Danville railroad seems to be an assured fact.

The mineral wealth of this county is very great, and was illustrated in part at the World's Industrial and Cotton Centennial Exposition by the following specimens:

From Virginia Midland Railway Exhibit.

1. *Iron Ore*, from Pittsville, contributed by Hood, of Pittsylvania Steel Company.

2. *Barytes*, from "Bennett" Mine, Pittsville.

3. *Barytes*, from "Parker" Mines, Pittsville.

4. *Barytes*, from "Thompson" Mines, two miles from Pittsville.

5. *Kaolin*, from Railway Company's land, Motley station.

6. *Iron Ore*, from Henderson & Bond, one-half mile from Motley.

7. *Asbestos*, from Railway Company's land, Pittsville.

8. *Gray Granite*, from Breem, one and a half miles from Dry Fork Station.

From Virginia Department of Agriculture.

1. *Asbestos*, from Walker Church.

2. *Red Oxide of Iron and Manganese*, from N. W. Cobb, Calland's.

3. *Marble*, from John L. Hurt.

Collected by E. D. Frazer.

4. *Manganese*, from Mrs. P. Snow, two miles north from Motley Station, Va., Midland railroad; probably a large deposit.

5. *Limonite*, brown iron ore, from Bond & Henderson's mine, one-half mile west from Motley Station.

6. *Magnetic Iron Ore*, from Pittsville mine.

7. *Barytes*, from mine of Pittsylvania Mining and Milling Company.

8. *Barytes*, from mine of Tanner & Bliss, Pittsville.

9. *Manganese*, from mine near Pittsville.

10. *Barytes*, from "Hamner" mine.

POWHATAN

was formed in 1777 from Cumberland county. It is 25 miles long and about 15 miles wide, and contains 163,313 acres of land, valued at \$974,476; value of town lots, \$6,804. Population—white, 2,726; colored, 5,091; total, 7,817. It has James river for its north and Appomattox river for its south boundary, giving extended water lines and marginal bottom lands of great fertility.

The surface, off from the streams, is gently undulating, and the soil mostly gray and of a light, friable texture, with some stiff clays. The productions are tobacco, corn, wheat, oats and hay, tobacco being the principal money crop. Fruits and the vine succeed well in this county, and are receiving much more attention. No section of the State is healthier than this. It is comparatively free from malarial influences and below the cold and damp of higher altitudes. It is an excellent part of the State to live in, and immigrants will find cheap land, good homes, and an intelligent, hospitable people, with churches and schools convenient.

Coal, mica, kaolin, iron ore and graphite are found in Powhatan, specimens of which were exhibited at the World's Exposition at New Orleans, as follows :

1. *Bituminous Coal*, from Norwood mine, Charles R. Kennon.
2. *Graphite*, Dr. W. H. Carhart, from collection of Virginia Department of Agriculture.
3. *Feldspathic Gneiss*, from same as above.
4. *Kaolin*, Dr. W. H. Carhart, from same as above.
5. *Iron Ore and Titanium*, from Mr. Leake, collection of Virginia Department of Agriculture.

I insert here a more detailed description of this county, contributed by a correspondent :

"This county—as the great number of spear heads, arrow points, tomahawks and other Indian relics found everywhere indicates—was at one time a favorite hunting and battle ground of the Red man, and is happily named for one of their greatest chiefs. There is only lacking capital and well directed energy to make it an Eden for the white man. Its natural advantages cannot be surpassed—lying as it does near the centre of Eastern Virginia, between the James and Appomattox rivers, which constitute its northern and southern boundaries, respectively, and with the numerous creeks and branches flowing into them, assure to the agriculturist a perfect drainage and an abundance of meadow land, besides furnishing an unlimited water power for manufacturing purposes. Railroad facilities are indispensable to all business men—to the farmer especially so, as it assures to him a speedy market for his perishable products. A choice of markets is a second great consideration; proximity to, a third. This county offers all three. Through its eastern border runs the Richmond and Danville system of roads (the largest in the South); along its northern boundary the Richmond and Alleghany road, connecting Richmond and all points of the West. There is a third road soon to be built through the centre of the county, and these, with the Appomattox river as a water way, guarantee to settlers all needed facilities. Again, the centre of this county is only some 30 miles from Richmond, the capital of Virginia, and her largest market and manufacturing centre.

"The soil is alluvial, but varies greatly in its characteristics—from a light, sandy soil, to heavy chocolate loam—thus furnishing soils admirably adapted to all the cereals, garden truck, and tobacco. Even the thin lands are valuable, for on them tobacco of the finest bright type has been grown, bringing as high as \$70 per cwt. On the divide, or water-shed of its two rivers, is a section of country that for its fruit-producing qualities has no superior. There, peaches are never killed by frost, and apples, pears, grapes, plums, damsons, &c., reach great perfection. Powhatan apples and grapes carried off the largest number of premiums at the last State Fair. Grape culture is destined soon to lead most of the

industries of this entire section. With us all of the cereals do well, where the soil has been properly prepared. Hay, too, is attracting the attention of our farmers much more than ever before. Clover, timothy and orchard grass are the principal varieties grown. The natural grasses abound, and in wet years, such as the present, as much as two tons per acre of after-math can be cut on our meadow lands. We grow all of the grades of tobacco, from the beautiful bright leaf to the heavy dark shipping. The latter is much sought after by our Richmond buyers, samples of which may be seen at the office of our State Commissioner of Agriculture.

"Our climate is very equable and healthy, having an average mean temperature similar to that of northern Spain and central Italy. Our lands are well timbered, with most of the harder woods—several varieties of oak, hickory, pine, maple, birch, poplar, gums, cherry, and walnut.

"The minerals are not wanting. In the eastern section of the county there is a large field of bituminous coal. The writer knows of veins from six to twelve feet thick. Our clays are noted, particularly the clay from which the celebrated Powhatan pipe is manufactured. We also have several mineral springs of well known virtue.

"Our county roads are fairly good; churches of all denominations conveniently located; public schools in every neighborhood, and saw and grist mills in close-proximity. Labor is easily obtained, and averages for men, from eight to ten dollars per month, with dwelling and rations.

"To all persons seeking healthy homes, cheap lands, easily improved, and a warm and hospitable Virginia welcome, we ask an examination of our county of Powhatan, feeling well assured that they cannot do better. For any particular information a letter addressed to E. B. Scott & Co., Huguenot P. O., Va., will meet with prompt attention."

#### PRINCE EDWARD

was formed in 1753 from Amelia. It is 25 miles long and about 12 miles wide, and contains 220,087 acres, valued at \$1,314,667; value of town lots, \$502,680. Population—white, 4,754; colored, 9,914; total, 14,668.

Appomattox river separates it from Cumberland and Buckingham, and by this stream and its numberless tributaries the county is well watered. The surface of this county is similar to those which adjoin it, being of a gently undulating character, with good bottom lands on the streams.

The soil is mostly formed from granitic or gneissoid rock, and is productive and easily improved. The productions are tobacco, wheat, corn, oats and hay. This is a good tobacco county, and produces an article of fine quality. Farmville, in the northern part of the county, is a thriving town, and a place of considerable importance as a tobacco manufacturing centre, being the fifth largest in the State. Near that place are found mineral waters containing a good proportion of lithia (see Cumberland county). Hampden Sidney College and the Union Theological Seminary are located near Farmville, also the State Normal School.

Transportation facilities are convenient to all parts of the county, and are afforded by the Norfolk and Western railroad passing through the northern portions, and the Richmond and Danville railroad in the southern parts.

Forest trees—pine, poplar, black and sweet gum, silver maple, several varieties of hickory, white and red oak, willow oak, black and white walnut, mulberry, cedar, dogwood, wild cherry, locust, chestnut, chestnut oak, slippery elm, black elm, cork elm, sycamore, birch, beech, and willow.

Springs of purest freestone water abound. There is no healthier region in the world. Churches and schools are convenient in every part. Labor costs from five to eight dollars per month, with board or rations.

A moral, hospitable people, good lands with houses and fences at cheap rates, offer strong inducements to the immigrant to settle in this healthy region.

The minerals consist of iron, copper, mica, kaolin, soapstone, buhr-stone, building-stone, and coal, but have not been developed. The following specimens were on exhibition at the World's Industrial and Cotton Centennial at New Orleans, La. :

1. *Fire Clay*, from land of Wm. T. Barrett, collected by Prof. W. H. Seamon.
2. *Bornite and Malachite Copper Ores*.

From Virginia Department of Agriculture :

3. *Copper Ore*.
4. *Quartz, Fluorspar and Pyrite*, from L. R. Howlett, Green Bay.
5. *Kaolin Balls*, three, from four miles of Prospect Station, from G. W. Bell.
6. *Mica*, from R. B. Wilson, Green Bay.
7. *Greenstone*.

### PRINCE WILLIAM

was formed in 1730 from Stafford and King George. It lies on the Potomac river, with Fairfax on the north, Loudoun and Fauquier on the west, and Stafford on the south. The surface is rolling and well watered. The soil is generally good, and there are many well improved farms. The productions are wheat, corn, oats, rye and grass in the western and middle, and trucking in the eastern portions.

The timber consists of oak, pine, chestnut, hickory, and other woods. It has 222,271 acres of land, assessed at \$2,066,721; value of town lots, \$76,860. Population—white, 6,580; colored, 2,600; total, 9,180.

The Virginia Midland railroad traverses it in a southwest course, and the Manassas Division to Strasburg penetrates the western part, while the Alexandria and Fredericksburg railroad runs through the eastern portion. The Potomac river furnishes water transportation and fine fishing shores. Occoquan river, forming part of its north boundary, drains most of the middle and western parts. The town of Manassas, at the junction of the Manassas branch of the Virginia Midland with the main stem, is a thriving and rapidly growing place. The battle of Manassas, celebrated as the first great conflict of the civil war, took its name from the place, which was fortified as a strategic point of much importance. The country around is picturesque and of pastoral beauty, and is steadily improving.

Gold, copper, barytes, slate, soapstone, brownstone, marble and limestone are found in this county. Prince William was represented at the World's Industrial and Cotton Exposition, New Orleans, by the following specimens of minerals :

From Virginia Midland Railway Company's exhibit.

1. *Glass Sand*, from Broad Run Station, from J. O. Blythe.
2. *Brownstone*, a block from Lynch's quarry, two miles from Manassas.
3. *Brownstone*, a block from quarry of Mayfield Brownstone Company near Manassas.

From Prof. Fontaine.

1. *Lignite*, from Neabsco creek on Telegraph road.
2. *Silicified Wood*, from same locality as above.

## SPOTSYLVANIA

was formed in 1720 from Essex, King William and King and Queen counties. It is 23 by 17 miles in extent, and contains 258,420 acres of land, assessed at \$1,196,561. Population—white, 8,422; colored, 6,406; total, 14,828.

The surface is mostly undulating, with much fertile bottom land on the numerous streams which form its drainage system. It lies between the Rappahannock and North Anna rivers, which form respectively its north and south borders. The interior is watered by the numerous tributaries of these rivers and of the Mattaponi. The wide bottom lands on these streams produce fine crops of corn, melons and vegetables. The soil of this county varies greatly, much of the upland being of tenacious clay, while that of the bottoms is mostly of a light, sandy texture.

The productions, besides those mentioned above, are wheat, oats, rye and grass. Large quantities of poultry, vegetables and fruits are sold in the Fredericksburg and other markets.

Fredericksburg is the principal city, and is one of the oldest in the State. It has a population of 4,970, and is located on the south bank of Rappahannock river at the head of navigation, with lines of steamers to Chesapeake bay and Northern cities.

Besides water transportation, this county has two railway lines—the Richmond, Fredericksburg and Potomac railroad, and the Orange and Fredericksburg Narrow-Gauge railway to Orange Courthouse, where it connects with the Virginia Midland.

Gold, iron, granite and sandstone are found in Spotsylvania.

The oldest furnace in America of which we have any certain knowledge was "Spotswood," in this county, described by Colonel Byrd in the "Westover Manuscript" a century and a half ago.

## SPOTSYLVANIA COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Iron Ore.*

2. *Decomposed Pyrite*, from Virginia Department of Agriculture.

The following were collected by E. D. Frazier, Esq. :

3. *Blue Granite*, from falls of Rappahannock, one mile northwest from Fredericksburg.

4. *Gray Granite*, from Mrs. Downman's quarry, one mile west from Fredericksburg.

5. *Sandstone*, from quarry of D. E. Fleming at Fredericksburg.

6. *Sulphurets*, gold-bearing, from Greenwood Gold Mine.

7. *Petrified Wood*.

8. *Hematite Iron Ore*, from abundant "float," on Hazard property.

9. *Limonite*, brown iron ore from land of Wm. Tabb, Tinder's Crossing P. O.

10. *Limonite*, brown iron ore, from land of G. R. Fox, six miles south from Parker's Station.

11. *Limonite*, brown iron ore, from land of James Buchanan, five miles east from Parker's Station.

12. *Manganiferous Iron Ore*, from land of the Wilderness Mining Company, five miles south from Parker's Station.

13. *Gold-bearing Quartz*, from "Whitehall" Gold Mine, three and half miles south from Parker's Station.

14. *Gold-bearing Slate*, decomposed, from same locality.
15. *Gold Ore*, decomposed vein matter, from same. Runs \$25 per ton of ore.
16. *Sulphurets*, accompanying gold-bearing quartz and black sand, same.
17. *Pyrites*, from same.
18. *Magnetite*, magnetic iron ore, from mine of Marysville Bloomery.
19. *Limonite*, brown iron ore, from mine of "Catherine" Furnace, on battlefield of Chancellorsville.
20. *Pig Iron*, charcoal, from old "Catherine" Furnace.
21. *Blast-Furnace Cinder*, from pile at old "Catherine" Furnace.
22. *Limonite*, brown iron ore, from mine Marysville Bloomery.
23. *Gold-bearing Quartz*, from "Vaucluse" Gold Mine, seven miles northeast from Parker's Station.
24. *Gold-bearing Quartz*, from "Mellville" Gold Mine, seven and a half miles northeast from Parker's Station.
25. *Sulphurets*, from "Vaucluse" Gold Mine, seven miles northeast from Parker's Station.
26. *Free Gold*, from "Whitehall" Gold Mine, three and a half miles from Parker's Station.

#### STAFFORD

was formed in 1765 from Westmoreland. Population—white, 5,558; colored, 1,653; total, 7,218. Area, 163,196 acres, assessed at \$906,743; value of town lots, \$256.

The Potomac forms the eastern and the Rappahannock the southern boundaries. Numerous creeks emptying into these rivers penetrate the interior, and are navigable to considerable distances. All these waters abound in valuable food fishes of many sorts, affording a handsome revenue to the owners and profitable employment to labor. They are also valuable for the water-powers utilized for mills, &c.

The surface is rolling, the soil naturally good, and readily responsive to ameliorating methods of farming. Marl and lime are being applied and the effects most beneficial.

The products are corn, wheat and oats, which are the main crops, and are profitably cultivated. Trucks and fruits are also profitable branches of agriculture. Clover and orchard grass yield good returns, and the grazing and rearing of sheep and early lambs for the near markets of the District of Columbia and Baltimore add greatly to the farmer's profits. Access to market is convenient by water and by the Richmond, Fredericksburg and Potomac railroad.

This county has abundance of forest land covered with oak, hickory, pine, walnut, elm, ash and other trees belonging to this section of the State. The minerals are gold, iron ore, and excellent sandstone for building purposes.

The people are kind and hospitable, the climate healthy and pleasant, land cheap, facilities for pleasant living and access to market all that could be desired. With all these advantages, it would seem hard to find a region better adapted to furnish good homes for the intending immigrant. The religious and educational advantages are good, the various denominations being represented and schools abundant.

Farming lands can be bought from \$2 to \$15 per acre, the latter price for very productive land. Some recent sales have been made for barely the cost of the improvements. The average yield per acre of crops is about as follows: Wheat, 8 to 20 bushels; corn, 25 to 30 bushels. Labor can be had from eight to ten dollars per month, with board or rations.

## THE PIEDMONT DIVISION.

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This section of Virginia, as its name implies, lies at the **FOOT** of the *Blue Ridge* Mountains. This range of mountains extends from the Potomac river, at or near Harper's Ferry, to the Dan river, which forms the dividing line at the point where the range crosses it between Virginia and North Carolina. Its direction is north-east and southwest; length about 250 miles.

The general elevation of this section ranges between 300 and 500 feet above tide-water. The sub-range of mountain ridges that runs through and parallel to the Blue Ridge in many points attains to altitudes of 100 to 600 feet higher. The area included in this section is about 250 miles long by 25 miles (average) wide—making about 6,700 square miles.

Lying at the foot of the Blue Ridge, its western border is indented by spurs running into it. Between these spurs there are *coves* of many sizes and shapes, watered by streams—the headwaters of rivers flowing east. This eastern slope of lands is broken by the *sub-range* of mountains above referred to, but the altitude and surface of this range are not of such a nature as to prevent cultivation and grazing on the highest points.

For beauty of landscape, variety of scenery, native fertility of soil, water courses contributing to practical benefit as well as to beauty of scenery, this section is surpassed by few, if any other sections in the United States.

Dr. Ellzey, of Washington City, D. C., in an *Address before the Southern Immigration Association*, says: "In its physical features, picturesque and lovely to an unusual degree; in climate, temperate and healthful; in the abundance and variety of its productions, unsurpassed; in all that makes life desirable and home what it should be, there is no place in this world which surpasses Piedmont Virginia—there are very few which come near it."

The counties composing this section are Loudoun, Fauquier, Culpeper, Rappahannock, Madison, Greene, Orange, Albemarle, Nelson, Amherst, Bedford, Franklin, Henry, Patrick, in all—14. (Detailed descriptions of these are given below).

Reference to the map of Virginia will show how this section is watered. The main rivers flowing through it or by its northern and southern boundaries are the Potomac, Rappahannock, Rivanna, James, Roanoke, and Dan. Besides these are numerous smaller rivers and creeks, formed by living springs. It would be safe to say that few areas of an hundred acres could be found in which one or more living streams is not found. None of these streams are navigable, nor any of them at present used for transportation within the bounds of this section, except in small batteaux for limited distances.

The *highest mountains* found in this section are "Peaks of Otter" (one 4,000 and the other 3,874 feet high) in Bedford county; "Fork," 3,850, "Bluff," 3,522,

"Ragged," 3,298 feet, in Madison county; "Cahas," 3,571, in Franklin county; Mount Marshall, 3,374, in Rappahannock county; "Bull," 3,215, in Patrick county; "Tobacco Row," 2,937 feet, in Amherst county; "Bull Run," 1,374, in Fauquier county, and "Peters," 1,824 feet, in Orange county.

#### RAILWAYS.

Reference to the map will show the conveniency afforded this section by railroads. The Baltimore and Ohio railroad skirts the northeast line of Loudoun county for a considerable distance, and the Washington and Western runs through the county. The Manassas Gap and Warrenton branches of the Virginia Midland railroad penetrate Fauquier. The Virginia Midland railroad runs through the counties of Culpeper, Orange, Albemarle, Nelson and Amherst. The county of Orange is also touched by the Fredericksburg and Piedmont (N. G.) railroad at Orange Courthouse, and by Chesapeake and Ohio railway at Gordonsville. Albemarle has the latter railroad traversing it from east to west, and the Richmond and Alleghany railroad on its southern border. Nelson has the Richmond and Alleghany on its southeast border, and is penetrated by the Virginia Midland railroad. Amherst is skirted on its southern border by the Richmond and Alleghany railroad for many miles, and is penetrated by the Virginia Midland railroad, and has the Norfolk and Western skirting its southern border below Lynchburg. Bedford is skirted by the Richmond and Alleghany railroad for some distance on its northern border, and the Norfolk and Western penetrates it. Franklin has the Pittsylvania and Franklin railroad (N. G.) running from the Virginia Midland railroad to Rocky Mount (the C. H.). Henry and Patrick are penetrated by the Danville and New River railroad (N. G.). Rappahannock, Madison and Greene counties are not reached by any railroad at present, but are not far distant from the Virginia Midland railroad.

This section contains 11,024 farms. Number of acres of improved land, 1,951,427; acres unimproved, 1,850,149; total, 3,791,576. Woodland covers about one-half the surface. The woodland consists of the following kinds of growth: Oak (many species), hickory, chestnut, locust, walnut, pine, cedar, beech, birch, gum, tulip, poplar, &c. The soil of Piedmont Virginia is mainly red in color, and much heavier than what is found in the Middle section. Prof. W. B. Rogers says: "In Piedmont the red color of the soil, derived from epidote and hornblende, is due to the large proportion of oxide of iron they contain—sometimes amounting to thirty per cent."

Hotchkiss says: "The red or chocolate colored soils of this section, formed from the decomposed, dark, greenish-blue sandstone here found, is generally considered the most fertile. This sandstone contains several per cent. of carbonate of lime. The other soils of this region are gray or yellowish. These are by no means as fertile as the darker soils; but there are red soils here as in Middle Virginia that are also poor, and for the same reasons."

The soils of Piedmont are undoubtedly many of them among the most fertile known, and can be made to produce a great variety and abundance of crops. They are easily worked; but if neglected they are soon covered by a growth of underbrush.

Mean temperature of Piedmont—annual,	-	-	-	-	53.7
" " " —winter,	-	-	-	-	44
" " " —summer,	-	-	-	-	78

Rainfall, 32 to 44 inches.

In the detailed description of the counties composing this section will be found

lists of minerals, and also of the manufacturing establishments lying in this section, as well as some other matters of interest, especially to those who may be looking to this section for homes and investments.

#### GRAPE CULTURE AND ORCHARDS.

In latter years the success in raising the grape in a number of counties in this section has largely increased the production of that fruit and the manufacture of wine. In 1876 the silver medal was awarded to the wine made by a company at Charlottesville, in Albemarle county, at the Paris Exposition—the only one received for excellence. This called attention to the products of the vineyards of that locality. Since that time great progress has been made in the raising of grapes. The fruit is largely shipped abroad and the surplus made into wine.

Two companies having wine cellars are in operation at Charlottesville, and many parties have found their lands peculiarly suited to the raising of the vine, and have devoted considerable areas to its culture.

It is believed by good judges that the Piedmont section, particularly some large areas of it, is the best apple region in Virginia or any other State. The "Albemarle Pippin" has attained to great reputation as an apple for export. As such it is much sought after, being esteemed the best apple ever carried to England. It special home seems to be confined, however, to the counties of Albemarle, Orange, Amherst and Nelson, possibly because these counties have given it more attention.

#### IMMIGRATION TO PIEDMONT

has been mainly to the counties of Albemarle, Orange, Loudoun, Bedford and Culpeper. The largest nationality represented in this is the English. Some of the finest estates in these counties have passed into their hands. Colonists from the Northern States have also settled in this section to a considerable extent. With a wise and timely sub-division of the land of this section, this immigration will largely increase, and, added to the natural increase of population, will make this section a densely peopled country, uniting as it does, to an eminent degree, the great elements of prosperity, viz: agriculture, minerals, and manufacturing sites and facilities.

#### TOBACCO CULTURE.

For the ten years 1870-80 tobacco culture has increased from 9,970,580 pounds to 21,512,805 pounds. Its production, however, is mainly confined to the counties of Greene, Orange, Albemarle, Nelson, Amherst, Bedford, Franklin, Henry, and Patrick—Bedford, Amherst and Franklin being the heaviest producers.

#### PECULIARITIES OF THIS SECTION AND SPECIAL ADVANTAGES AS A HEALTH RESORT.

Major Jed. Hotchkiss, in *The Virginias*, June, 1884, says: "We would call attention to the fact that the Blue Ridge region in Virginia is, as can be proven by the testimony of consumptives fully restored to health, the best *Sanitarium* in the United States east of the Mississippi. The sheltered eastern slopes of the long stretch of that mountain range in Virginia, above the line of 1,000 feet of elevation above the ocean level and under that of 2,500, offers hundreds of localities for health resorts for people afflicted with pulmonary diseases, that surpass any others that we know of or have read of. During the past thirty-six years the writer has frequently recommended this region to persons having such diseases,

and in every case where the advice was followed, a restoration to health has resulted. If anyone is skeptical about the efficacy of the Blue Ridge air, water and exercises, as remedial agents for lung troubles, let him spend a few months at some point in this belt, and we will make him the referee to sustain the opinion here advanced. A young man from Vermont, a victim of this especially fearful New England disease, took his advice and spent the winter of 1882-83 there, and went away with restored health that still continues. We could name other cases.

"About the best such people could do would be to buy a few acres of the Sunward dry air slope of the Blue Ridge in Virginia, and busy themselves raising grapes and other fruits while inhaling health and strength. There are at least 200,000 acres of such sanitary country for occupation, room for 20,000 people with ten acres for each, and none of it remote from railways or markets; and here, too, is the region for building up extensive establishments for health and pleasure that will have a large all-the-year-round patronage."

General McDonald, editor of the "*Industrial South*," referring to the above, says: "We may say that we have some personal knowledge of the particular locality mentioned, and from our own observation are quite inclined to acquiesce in the opinion of Major Hotchkiss. Among others whom we met at Afton (in this belt) was a very intelligent and pleasant gentleman in the government service at Washington, from whom we learned that, being subject to rheumatism, he thought it well, before determining where he would spend his summer vacation, to consult the Signal Bureau—the desideratum being a dry atmosphere. The officers examined their records, and reported to him that the driest mountain atmosphere of which they had knowledge was at a place on the Blue Ridge called Afton—of which he had never before heard—and his experience had attested the correctness of the advice that sent him there. So dry is the atmosphere that a newspaper spread on the grass at night shows no sign of moisture next morning, although the night is much cooler than the day."

## COUNTIES OF PIEDMONT VIRGINIA.

## GROUPING IN NATURAL SUB-DIVISIONS.

## COUNTIES.

Potomac Waters..... { Loudoun.  
Fauquier.

Rappahannock Waters..... { Culpeper.  
Rappahannock  
Madison.  
Greene.  
Orange.

James Waters..... { Albemarle.  
Nelson.  
Amherst.

Staunton Waters..... { Bedford.  
Franklin.

Dan Waters..... { Henry.  
Patrick.

## PIEDMONT VIRGINIA.

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### ALBEMARLE

is one of the largest counties of the State, its area being 463,228 acres, thirty-seven per cent. woodland, assessed at \$4,559,634; value of town lots, \$1,733,980. Population, 32,628—white, 15,959; colored, 16,659.

Its southern boundary is James river, its western the Blue Ridge mountains. A sub-range of mountains passes through it, which, with the main range and spurs, makes the surface very diversified. There is a large proportion of fine farming land in the county. It is well watered by the James, the Rivanna and the Hardware, and their tributaries. These streams furnish abundant water-power, some of which is well utilized. The soil is mainly dark red, well adapted to the staple crops of the Piedmont section, and particularly so for clover, apples, grapes and fruits generally. The Albemarle Pippin took its name from this county, and here reaches its greatest perfection. In no county of the State has the culture of the grape been so successful. The fruit is largely sold and the wine has a high reputation.

There are two large wine cellars at Charlottesville—that of the Monticello Wine Company has a capacity of 150,000 gallons, which can be increased to 200,000 gallons by the use of larger casks, and that of Mr. Hotopp has a capacity of 50,000 gallons, to which he is now excavating an addition of 70,000 gallons. Mr. Hotopp has also a house cellar of 30,000 gallon capacity now in use. Large plantings of vines are being made yearly.

This county has fine transportation facilities to markets in all directions, by means of the Chesapeake and Ohio railway crossing its territory from east to west, and the Virginia Midland from north to south, (these roads cross each other at Charlottesville, the county seat), and the Richmond and Alleghany railroad passing along the south border. The minerals of this county are varied and valuable, consisting of iron, gold, lead, manganese, slate, soapstone, limestone, marble, sandstone and granite.

Albemarle has a number of towns and villages—Charlottesville in the centre and Scottsville in the southern border being the principal. At the latter place the James River Valley Agricultural Fair is held annually.

Charlottesville, the county seat, is a thriving town on the Rivanna river, in the most beautiful part of this picturesque region. Population, about 5,000. It is now rapidly improving, has recently been lighted with gas, and is abundantly supplied with pure water by natural fall from a mountain stream a few miles distant. The same reservoir supplies the University of Virginia, which is situated in the suburbs of the town.

Albemarle presents many varied attractions which settlers are not slow to avail

themselves of. Besides being one of the most fertile counties of Piedmont Virginia and the centre of a great fruit producing region, it is the seat of two noble institutions—the University of Virginia and the Miller Manual Labor School. The University at Charlottesville is too well known to need a minute description here. Suffice it to say that it is second to no institution of learning on the continent, and is attracting great numbers of students from all quarters of the country. The location is one of unsurpassed beauty.

The "Miller Manual Labor School" is now in full tide of successful operation. Magnificently endowed by the late Samuel Miller, of Lynchburg, a native of Albemarle, and splendidly equipped for the object indicated by its name—giving a technical education to boys—this school is being so conducted as to justify the most sanguine anticipations of its founder. More than two hundred boys are being educated here. In connection with the institution a productive farm of one thousand acres is cultivated on scientific principles. Probably there is no instance in this country where a large bequest for an object like this has been administered with greater wisdom and fidelity.

Besides these noted institutions there are many private schools, both male and female—some of them widely known; and a well organized system of free schools.

There are many English and Northern settlers in this beautiful county.

Albemarle spent \$15,000 in 1884-5 in permanent improvements on its roads, preparatory to putting them under contract, and now pays about \$4,000 annually to have them kept in repair.

Between 1880 and 1885 the value of the farming lands increased from \$4,765,132 to \$5,371,705—\$606,573, about 13½ per cent., according to the State assessments. In 1880 farm lands away from the towns sold for from \$5 to \$30 per acre; in 1885 they sold for from \$5 to \$50 per acre.

Vineyards, orchards, &c., in 1880, about 800 acres; in 1886, about 2,000 acres.

Labor is of good quality, in sufficient quantity, and rather higher. In 1880 a man got forty cents per day and board; in 1886 he gets fifty cents per day and board for ordinary farm work. Good laborers by the year run from \$120 to \$150, with board, house, &c.

Clover seed has become one of the regular crops on many farms, and from one to three bushels per acre is reaped.

The taxes in this county for all purposes have never reached one per cent., and generally range from 75 to 90 cents on the \$100. The debt of the county is about \$20,000, payable in instalments of \$2,000 to \$3,000 per annum.

Albemarle county had on exhibition at New Orleans the following specimens of minerals, collected by Professor W. H. Seamon of the Miller School. These and others to be collected by Professor Seamon are placed in trays, with compartments made of native woods by the boys of the Miller School, and the localities from which they were obtained indicated on a map of Albemarle county prepared at this school:

1. *Species of Granite*, from North Garden station, Virginia Midland railroad.
2. *Magnetic Iron Ore*, from Mrs. Martin's land, near North Garden; mine formerly worked.
3. *Soapstone*, cut samples, from Albemarle quarry, five miles east from North Garden station.
4. *Iron Ore*, specimens from Yates' farm, near Albemarle quarry.
5. *Slate*, highly charged with graphite, same locality as 4; probably valuable.

6. *Igneous Diorite*, a parallelopipedon from Dike near Faber station, Virginia Midland railroad; shows peculiar manner this rock weathers.
7. *Mica Schist*, from Faber Lead Mines.
8. *Mica Schist*, another variety from same place.
9. Ores and minerals of various kinds, six or seven specimens from Faber Lead Mines.
10. *Slate*, charged with micaceous iron ore, from Norvell's farm, near Howardsville.
11. *Brown Hematite Iron Ore*, float, from same place as 10.
12. *Manganese Ore*, from same place as 10.
13. *Puddingstone Conglomerate*, from Howardsville.
14. *Red Sandstone*, from near Howardsville.
15. *Felsite*, from Israel Mountain.
16. *Blue Quartz*, from Israel Mountain. Thin sections of this show rutile.
17. *Massive White Quartz*, from Miller School farm.
18. *White Quartz*, from Israel Mountain, filled with muscovite.
19. *Calico Rock*, from north branch of Mechum river.
20. *Hydro-mica Slates*, from Miller School farm.
21. *Quartz Crystals*, from Miller School farm.
22. *Oxide of Iron*, pseudomorph, after pyrite, from various parts of county.
23. *Ilmenite*, from Israel Mountain.

The following specimens were kindly lent by Professor Wm. M. Fontaine, of the University of Virginia, from his collection :

24. *Slate*, with dendritic markings, from Albemarle Slate Quarry.
25. *Granitic Granulite*, suitable for mill stones, from Moorman river, where it is in vast quantities.
26. *Sandstone*, from Moorman river, from point west of Whitehall; very abundant.
27. *Metamorphic Conglomerate*, from Rockfish Gap tunnel, Chesapeake and Ohio railway.
28. *Epidote*, from same locality.

The following was shown in the exhibit of the Virginia Midland railroad, from Albemarle county :

1. *Graphite Slate*, three-quarters of a mile from Charlottesville.
2. *Slate*, a slab, from Albemarle Slate Co., six miles from Charlottesville.
3. *Iron Ore*, from Stony Point.
4. *Wine*, three cases from Wm. Hotopp, Charlottesville.
5. *Wine and Brandy*, one case from Monticello Wine Co., Charlottesville.
6. *Soapstone*, a block from Albemarle Soapstone Co., five miles from North Garden station.

The following were collected by Prof. W. H. Seamon, of the Miller School :

29. *Purple Roofing Slate*, from the Albemarle Slate Quarry, ten miles south from Charlottesville.
30. *Green Roofing Slate*, from same locality as above.
31. *Tile Slates*, from same.
32. *Marbleized Slate*, for mantels, &c., made at works of above quarry.

33. *Iron Ore*, from Stony Point.
34. *Iron Nodule*, showing black, velvety surface with crystals of white quartz, from Stony Point.
35. *Magnetic Iron Ore*, from Israel Mountain.
36. *Quartz Crystals*, from Stony Point.
37. *Sandstone*, from ridge south of Charlottesville, used for foundation walls of Lewis Brooks Museum.
38. *Mica Schist*, quarried near gas works, Charlottesville, for curbstones, &c.
39. *Mica Schist*, from near Bethel station, Virginia Midland Railway.
40. *Quartz*, from east flank of Carter's mountain.
41. *Granite*, from Dr. Michie's, near Piney mountain.
42. *Syenite*, from same locality as 41.
43. *Slate*, from Slate Hill Church.
44. *Quartzite*, feldspathic, from near Batesville.
45. *Hydro-mica Schist*; Batesville.
46. *Greenstone*, with quartz and pyrite, from near Powell's.
47. *Red Sandstone Conglomerate*, at Dyer's store, Scottsville.
48. *Red Sandstone*, from same as above.
49. *Red Sandstone Conglomerate*, from same.
50. *Red Oxide of Iron*, from same.
51. *Coarse Felsite*, from Blue Ridge, at Turk's Gap.
52. *Syenite*, from Miller School farm.
53. *Blueish Sandstone*, from east flank of Carter's mountain.
54. *Syenite*, containing hydro-mica, from near Brownsville.
55. *Gneiss*, from Morris' mill, near Batesville.
56. *Greenstone*, from Powell's mill, near Crozet station, C. & O. railway.
57. *Gneiss*, or calico rock, from Ivy station, C. & O. railway.
58. *Felsite*, from near North Garden station, Virginia Midland railway.
59. *Feldspar Conglomerate*, from Blue Ridge, at Greenwood station, C. and O. railway.
60. *Feldspathic Rock*, from same locality.
61. *Epidosyte*, same locality.
62. *Epidote and Calcite*, from Blue Ridge, at Turk's Gap.
63. *Quartzite*, feldspathic, from same locality.
64. *Hornblende Schist*, with epidote, quartz and pyrite, same locality.
65. *Hornblende Slate*, from same locality.
66. *Quartz*, with crystals of epidote; same.
67. *Conglomerate*, same locality.
68. *Chert*, same locality.
69. *Pudding Stone*, containing epidote, feldspar and hornblende; same locality.
70. *Talcose-Schist*, containing grains of amethystine quartz; same locality.
71. *Conglomerate*, same locality.
72. *Greenish Schist*, same locality.
73. *Quartzite*, same locality.
74. *Quartz*, showing jointed structure.
75. *Red Soil*, from foot of Southwest mountain; results from decomposition of epidotic rock.
76. *Bedded Diorite*, from Miller School farm.
77. *Mica-Schist*, from Miller School farm.
78. *Sandy Soil*, from Mechum river bottom lands, Miller School farm.
79. *Loam*, from hillsides of Miller School farm.

80. *Map of Albemarle County*, made by pupils of Miller School, showing location of above minerals.

### AMHERST

was formed in 1761 from Albemarle. It lies on the north bank of James river, which forms the boundaries of two of its sides a distance of over fifty miles. The alluvial lands of this river with those on the Pedlar and Buffalo rivers, which intersect the county, are very fertile, adapted to growth of all the grains, grasses, and fruits, while tobaccos of the heaviest grade and finest texture are abundantly grown. "The red lands of the county along the valleys and spurs of the Blue Ridge and Tobacco Row mountains are among the finest in the State, and in addition to usual crops is finely suited to grapes and fruits. The celebrated Albemarle Pippin succeed admirably here, while the sides of these mountains present the finest opening for successful vine culture. The Richmond and Alleghany, Virginia Midland, and Norfolk and Western railways offer markets in Lynchburg, Richmond, Alexandria, Danville, Washington and the great cities north. In minerals the rich hematite, magnetic and specular iron ores of the Central Virginia Iron Company, the Dover Coal and Iron Company and numerous individual land owners offer fields for profitable investment. Iron ore of best quality is now being supplied from the lands of the Central Virginia Iron Company to the Lynchburg furnace. The iron and steel from these ores is of superior quality; some of these veins analyzed as high as 66 per cent. iron, and are said to be the best south of Lake Superior. The county is also penetrated by numerous veins of copper ore which have once been worked; also marble and plumbago are both found. Along the Blue Ridge abundant and rich deposits of tin ore are now being developed, which, at no distant day, are expected to bring abundant capital for investment. The timber consists of oak, hickory, walnut, pine, chestnut, maple, dogwood, poplar, cherry, locust, mulberry, &c.

"We are awaking from a Rip Van Winkle sleep on the subject of roads, and if we push the present system will soon compare favorably with our neighboring counties in good public roads. Good wagon roads will develope the magnificent resources of this county and be more likely, in the writer's opinion, to invite immigration and capital than railroads. The cattle trade of the county is considerable; many cattle are bought in the counties south, and grazed upon the fine grass lands of the mountains. Bee culture has enlisted some attention and those who have embarked in it have found it profitable. The lands are cheap and those contemplating purchasing will find an inviting field."

This rich and beautiful county is twenty-two miles long, and has a mean width of nineteen miles, and contains 288,739 acres, valued at \$1,953,714; value of town lots, \$81,950. Population, 18,703—white, 10,001; colored, 8,702.

Its main market is Lynchburg, with which it is connected by a free bridge. Amherst C. H. is a pleasant little town on the Virginia Midland railroad, which runs through the county. The Richmond and Alleghany R. R. runs along its southern border for some distance, and the Norfolk and Western runs on its border below Lynchburg for about six miles. The county is susceptible of great development.

The minerals found here are varied and immensely valuable. Great deposits of magnetic and specular iron ores are found here suited for the manufacture of steel by the Bessemer process, and of a purity not excelled by any ores south of Lake Superior. The brown hematite iron ores are also in great abundance, and are cheaply mined, and scarcely less valuable than the specular and magnetic. These

ores are found in contact with or in the vicinity of limestone. There are many mines of these ores worked in the county. Copper, lead, slate and tin are also found in Amherst.

Specimens of minerals from Amherst county exhibited at the New Orleans World's Exposition :

The following were contributed by Col. Dunlap :

1. *Magnetic and Specular Iron Ores*, from Maud Vein Mines, near Stapleton, Richmond and Alleghany railroad.
2. *Syenite*, blue granite, from Bent Creek, near Gladstone station, Richmond and Alleghany railroad.
3. *Roofing Slate*, from Snowden Slate Quarry, near Rope Ferry station, Richmond and Alleghany railroad.
4. *Iron Ore*, from near Riverville station, Richmond and Alleghany railroad.
5. *Steel Iron Ore*, of Vein No. 6, near above locality.
6. *Steel Iron Ore*, of Vein No. 6½, near above locality.
7. *Copper Ores*, carbonates, malachite, bornite, azurite, red oxide and copper glance—yielding from 27 to 49 per cent. metallic copper, from Piedmont Copper Mines in Glades.

The following are from Prof. Fontaine, of the University of Virginia :

8. *Syenite*, from Balcony Falls, occurs in large quantities.
9. *Syenite*, from Piney river, in large quantities.
10. *Granulite*, from Balcony, would make a handsome building stone.
11. *Bornite and Stalactic Copper Ores*, from Dr. Charles Slaughter's.
12. *Magnetic Iron Ore*, from 4 feet ledge of solid ore on Indian creek.

### BEDFORD

was formed in 1753 from Lunenburg. The extreme length from north to south is forty miles, its width about thirty miles. It contains 490,733 acres of land, assessed at \$3,148,285. Population, 31,205—white, 18,528 ; colored, 12,677.

The surface is broken, and the western part mountainous. The Peaks of Otter in this county are among the loftiest in the Southern States, and afford a magnificent view of the surrounding country. The county is well watered by springs of the purest water, brooks and creeks. The lands are productive and when properly farmed produce fine crops of tobacco, cereals and almost every variety of the grasses. Blue-grass is indigenous and affords fine grazing for sheep and other stock. Land plaster acts finely upon these lands. In the greater part of the county we find the red clay lands, in others light gray or slate ; on the two last fine bright tobacco is grown to great perfection ; notably is this the case in the Goose creek valley. Land sells from one dollar to fifty per acre, improved land usually sells from eight to twenty dollars per acre. On the southern slope of the Blue Ridge mountain and its numerous spurs grapes grow in great perfection, and a superior quality of wine is made. Fruits do well here, notably apples.

“There is no healthier county in the State. All the boarding houses and hotels in the county are filled during the summer months with people from the Southern States. The Norfolk and Western railroad passes through the centre of the county and has six depots and stations within its limits. The Richmond and Alleghany railroad runs along the northeastern border for twenty miles and has several stations

and depots. The roads and turnpikes of the county will compare favorably with those of any county in "Piedmont" and the Valley.

"Liberty, the county seat, is situated near the centre of the county and is a flourishing town of some two or three thousand inhabitants, is noted for its healthfulness, has some eight or nine large tobacco factories, two large tobacco warehouses, one woolen mill, two flouring mills, one spoke factory and a planing mill and machine shop, besides other industries. The town is supplied with pure water brought by pipes from the Peaks of Otter. There is an Episcopal, Presbyterian, Methodist, Baptist and a Catholic church in the place, besides one or two churches for the colored.

"Bufordville, situated on Norfolk and Western railroad, is a village of one hundred and twenty-five inhabitants, with a Presbyterian and Episcopal church, two large hotels for summer boarders, stores, school, shops of various kinds, depot, &c. The hotels are filled every summer. This village is near the northwestern extremity of Goose creek valley, the most productive section of the county. There has been shipped from the Bufordville depot from January 1st, 1886, to 1st September, 1886, 510,550 pounds of tobacco, which, owing to the low prices now prevailing, has not averaged more than eighteen dollars per hundred.

"In this valley we have limestone in abundance; sheep do well, pay one hundred per cent.; cattle are at home here; lands are comparatively cheap; new comers will be kindly received."

We append the following interesting extract from a letter sent by three leading citizens of Bedford:

"Mr. Glen Walker, an Englishman, bought several years ago a large tract of land in the northeastern part of Bedford county and planted 11,000 grape vines; they are in full bearing. He has established a wine cellar and is preparing to plant 50,000 additional grape vines. His success is so marked that other gentlemen are preparing to follow his example. The grapes in the lowlands mature earlier than those in the highlands; there is no part of the county unsuitable for grapes.

"The county abounds with fine fruits—apples, peaches, pears, plums, cherries. Peaches have been grown in the county measuring from ten to twelve inches in circumference; the flavor is also excellent.

"A great effort is being made, with hopes of success, to construct a railroad from Big Island on Richmond and Alleghany railroad southward to Danville. Should that be done almost every farm would be within about six miles of a railroad.

"There is one large fruit canning establishment in the county, conducted by Mr. Moomaw.

"The woolen mills at Liberty are in successful operation. They are furnishing large quantities of cloth to distant purchasers, including Wanamaker of Philadelphia. The purchases for the U. S. navy are extensive, and not long since the agent for the navy said it was the best cloth he had ever bought."

The following minerals are found in the county: Cyanite, zinc, pyrotite mica-slate, pyrite, aluminous shales, hornblende gneiss, mica, limestone, magnetic iron ore, red and brown hematite iron ore. Of the latter the supply is very large. Major Hotchkiss pronounces it "inexhaustible." General Imboden pronounces it to be high grade, and practically inexhaustible. Prof. Wells, of Roanoke College, says it may be termed "The Iron Mountain of Virginia."

The county is watered on its northeast boundary by the James and its tributaries, by the Otter river and its headwaters in the central part of the county, and the Staunton and its tributaries on its southwestern border. The Blue Ridge forms its northwestern boundary between Botetourt and Roanoke.

It has the Norfolk and Western railroad running through its centre, the Richmond and Alleghany railroad on its northeast border and the Virginia Midland running in close proximity to its eastern border.

This county is susceptible of great development ; it has received quite a large influx of new settlers from England and elsewhere, and there is room for many more.

### CULPEPER.

Culpeper is not wholly a Piedmont county. The lower portion runs down into Middle Virginia ; hence its surface is less rugged than that of some of the other Piedmont counties.

Its area is 236,928 acres, assessed at \$2,110,286 ; value of town lots, \$249,578. Of this area thirty per cent. is woodland. Population, 13,408—white, 6,785 ; colored, 6,623.

Culpeper is watered by the Rappahannock and Rapidan rivers and their tributaries, which afford fine sites for mills, &c.

The Virginia Midland railroad traverses the county from northeast to southwest. Culpeper, the county seat, is on this road. It is a town of 2,100 inhabitants, and enjoys a good trade with the surrounding country. It is one of the most thrifty towns in the State.

Stevensburg is a village near Brandy station.

There are a number of factories in the county—a chair factory near Culpeper, plow-beam and barrel-stave factory near Stevensburg ; also factory for spools and shuttle blocks ; another for same near Cedar Run battle field.

This county was the camping ground of both armies for much of the civil-war period, and was therefore denuded of much of its wood ; but so rapid has been the second growth that the destructive effects of the war are scarcely visible at this time.

In "*The Virginias*," of August, 1882, Major Hotchkiss says : " We would like to have some of the forest-wise people, who are croaking about the destruction of our forests, and predicting that we will have a treeless country in a short time, see how rapidly and beautifully Culpeper and other counties along the Virginia Midland, that were almost deforested during the late war by the great armies that camped and wintered there, are now becoming afforested in half a generation. We noticed a few days ago fuel and fencing being cut where Meade's army burned up every tree in 1863-4."

" The large development of the secondary formation of the triassic period is an interesting feature in Culpeper county.

" This formation extends in a northeast course from the Rapidan river to the Potomac, and in Culpeper county attains a breadth of ten or fifteen miles. The indifferent soil, known locally as Black Jack lands, is within its bounds, but the decomposition of its red and chocolate colored shales furnishes lands of the best quality, easily improved and well adapted to grain, grass and tobacco. The lands underlaid with blue slates and shales are especially suited for wheat."

" Trap dykes intersect this formation in many places, and furnish with the adjacent indurated sandstones hard and durable building stone.

" The formation is diversified by elevations of moderate height, probably formed when the southwest range of mountains was upheaved. Several of these make most desirable locations for raising grapes and other fruits. The small Twin mountains near Rapidan station are noted for their ruggedness ; large columns of sandstone strata having been forced up from below, form an interesting and curi-

ous spectacle, giving the geologist an excellent opportunity of studying the nature of the inembent strata.

"Another interesting and most valuable formation traverses this county from near Raccoon ford, on the Rapidan, towards Kelley's mill, on the Rappahannock. This is the narrow limestone belt which extends nearly through the State, passing from Culpeper through Orange, by way of Mountain run and Gordonsville; through Albemarle to James river near Scottsville; and thence to within five or six miles of Lynchburg, the James flowing along or over its measures for nearly forty miles; thence through the counties of Campbell, Pittsylvania, Franklin, etc., having in its entire course the same general characteristics, viz: a narrow limestone or marble formation, accompanied by iron and manganese ores and other minerals. The limestone, though somewhat mixed with silicious matters, makes excellent lime for agricultural purposes, and with lands on both sides needing most sadly its application, it is marvellous that so little use is made in Piedmont Virginia of this most beneficent gift of nature.

"The eruptive force elevating the Southwest Mountains gave rise to the elevations and broad rolling plateaus and hills, with rounded outline and long slopes on the west side of the triassic formation, and being underlaid, like the Southwest Mountain lands, with trap, greenstone and epidotic rocks, a red soil is formed, of excellent quality, with a good proportion of lime and potash, and capable of the highest improvement. There is a large extent of these lands in Culpeper; they abound in picturesque views and situations, and being entirely healthy and free from malaria, furnish most desirable locations for delightful homes."

#### CULPEPER MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Gold-Bearing Quartz*, from "Culpeper" mine, Major C. Knapp.
2. *Gold-Bearing Quartz*, from Richardsville, W. B. Love.
3. *Gold-Bearing Quartz*, from "Ellis" mine.
4. *Gold-Bearing Quartz*, from Culpeper Gold-Mine, eighteen miles west from Fredericksburg.

From Virginia Midland Railway exhibit.

5. *Copper and Iron Ores*, from Major E. B. Hill, one mile from Culpeper station.
6. *Iron Ore*, from W. S. Wallace, seven miles from Brandy station.

#### FAUQUIER

was formed in 1759 from Prince William. Its length is forty-five miles; mean breadth, sixteen miles. The surface is gently rolling and in some parts hilly. The hill lands have a strong soil; the level lands are mainly gray sandstone.

The lands are fertile, especially the noted greenstone (*epidote*) lands, which constitute the richest part of this productive county. Here the nutritious blue grass of Piedmont Virginia grows spontaneously, while cultivated grasses of every variety flourish luxuriantly, as do all the cereals, especially wheat and Indian corn; and fine crops of corn, wheat, oats, rye and grass are produced. Fauquier is abundantly watered by the Rappahannock, Occoquan, and numerous creeks. The timber is oak, hickory, chestnut, walnut, poplar, locust, ash, cherry, cedar, sycamore, sassafras, elm, gum, mulberry, dogwood and pine.

The population is 22,993—white, 13,688; colored, 9,305. Number of acres of land 419,537, assessed at \$7,122,953; value of town lots, \$603,822. The productions of this county furnish a large surplus for market. Fauquier is one of the health-

iest and most prosperous counties in the State. The Virginia Midland railroad, the main stem, the Manassas branch, and the Warrenton branch, penetrating this beautiful and fertile county in various directions, give it excellent market facilities.

Fauquier has gold, iron ore, marble and asbestos. Mr. J. B. Beverly, Jr., and Mr. J. C. Little, in interesting letters, state that there are found in the county iron ores in the form of specular, limonite, ilmenite, pyrites; also copper pyrites. Limestone, as marble, near the "Plains" station. This marble is very compact, close grained, gray and white. Also, barytes of excellent quality. There are several marble quarries; and gold is also mined in the southern part of the county: it is in the form of sulphuret.

The Rappahannock river forms its southern boundary and separates it from Culpeper and Rappahannock counties. This is a large and wealthy county, and has among its farmers some of the most successful and prosperous in the State. The cereals and grasses, with horses, sheep and cattle, constitute the main products. Cattle fattened upon the blue grass lands of Fauquier are in great request in the markets of Washington, Baltimore and the great cities further north, and have been largely shipped to Europe of late years.

Warrenton is the chief town and county seat, and is the centre of a refined and intelligent community. It has a population of more than 1,500, and has numerous churches and schools. Near by is the Warrenton White Sulphur Springs, a popular resort for pleasure and health.

Fauquier ranks high as regards quality of soil, beauty of scenery, healthfulness and general prosperity. In its borders are thirteen railroad stations, a number of which are flourishing towns or villages.

#### FAUQUIER MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Iron Ore*, from Henry Sempers.
2. *Syenite*, rough block, from Alf. Chappellear.
3. *Feldspar or Kaolin*, from Wm. E. Gaskins, two miles from Warrenton.
4. *Copper Ore*, from "Sealock" mine.

#### FRANKLIN

was formed in 1784 from Henry and Bedford. It is 30 miles long and about 20 miles wide. The Roanoke (there called "Staunton") river runs on its northeast border, and the county is intersected by Pigg and Blackwater rivers and their numerous tributaries. The surface is rolling, as in the Piedmont counties generally. The soil is very fertile, and produces large crops of tobacco, corn, wheat, hay and oats. The population is—white, 17,069; colored, 8,015; total, 25,084. This is a very healthy county. Good land can be bought at \$4 to \$10 per acre. (This estimate was made several years ago, before the railroad to Rocky Mount opened up the county to the markets of Danville, Lynchburg and other cities). Franklin contains 436,753 acres, assessed at \$1,732 308; value of town lots, \$71,400.

This county, like the rest of Piedmont, is an excellent fruit region, particularly adapted to apples and grapes; and it is also a good grass and stock-raising county. The minerals are iron, limestone, mica, asbestos, granite, and soapstone. The Franklin and Pittsylvania railway has been recently completed from Elba, near Ward's Springs, in Pittsylvania county, on the Midland railroad, to Rocky Mount, the county seat, near the centre of the county. This relieves the farmers of Franklin of a long and costly cartage of their produce, and must greatly enhance

the value of property. It has given a good impetus to the development of the valuable iron ores found here, as well as to that of the agricultural resources of this fertile county.

#### FRANKLIN COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Asbestos*, from Captain F. J. Chapman.
2. *Magnetic Iron Ore*, from Rocky Mount mines, F. J. Chapman.
3. *Magnetic Iron Ore*, from Rocky Mount.
4. *Magnetite*, from "Franklin" mine, 1½ miles northwest from Rocky Mount.
5. *Magnetite*, from Capt. C. J. Saunders' mine, eleven miles southwest from Rocky Mount.
6. *Granite*, from W. C. Smithers' quarry, one mile northwest from Rocky Mount.

#### GREENE

lies northeast of Albemarle; its northwest boundary, the crest of the Blue Ridge, which separates it from Rockingham, in the Shenandoah Valley. Its population in 1880 was—white, 4,005; colored, 1,825; total, 5,830. It contains 105,846 acres of land, assessed at \$496,469; about 42 per cent. of this is woodland.

Much of the surface is mountainous or semi-mountainous, but the less broken portions are fertile. It is watered by the Rapidan river and its tributaries, and the headwaters of the Rivanna river.

Stock, especially sheep, are profitably raised in this county.

Timber is abundant. The minerals found are copper and iron ore. Having no railroad for transportation of its products, these ores are not developed as they might be. The Virginia Midland railroad runs within a few miles of the eastern border of the county.

Stanardsville is the county seat—a small village. With cheap lands and a healthful and pleasant climate, Greene county offers good inducements to settlers from other parts of the country. Good farms with improvements can now be bought for \$15 per acre, and unimproved lands \$1.50 to \$8 per acre, but will rapidly rise in price when penetrated by a railroad. Mountain lands are sold at ten cents to \$2.50 per acre.

#### HENRY

was formed from Pittsylvania in 1776. It is nearly a square of 18 miles, and contains 239,003 acres, assessed at \$1,119,445; value of town lots, \$214,691. Population—white, 8,614; colored, 7,395; total, 16,009.

The surface is undulating—in parts hilly, and there are some considerable mountains. Smith's river flows through the middle of the county and "Mayo" through the southwest. These, with their numerous branches, afford ample water-power.

The soil of Henry is very fertile and the climate salubrious. A correspondent well says: "In this county we have comparatively warm winters and cool summers; and there is scarcely a county in the State freer from malaria than this. Perennial streams of fine freestone water are found in all parts."

This is a fine grass county. Clover, blue grass, timothy, orchard, Randall, tall meadow oat grass, and red-top, all grow remarkably well here, as do all the cereals grown in Virginia.

The tobacco of Henry is celebrated for its fine quality, and the production is rapidly increasing.

The grape is at home here, as are the apple, peach, nectarine, almond, (?) apricot and fig.

"The calycanthus grows wild in the sheltered dales of this picturesque region."

"Sweet potatoes do well here. From two to three hundred bushels can be raised per acre under good cultivation; in fine, as our correspondent well says, "God has blessed this county with every advantage of fertile land and salubrious climate, and all that is necessary to succeed is to trust in God, speed the plow, use commendable economy, and cultivate the land in a manner commensurate with its great natural advantages." Labor is cheap—\$75 to \$100 per year, with board, &c.

Since the Danville and New River railroad was constructed through Henry the town of Martinsville, the county seat, has grown with phenomenal rapidity. Within five years it has increased from a population of three hundred to about three thousand at the present time. It is a live town, having ten tobacco factories and nearly a half million of dollars invested in manufacturing enterprises of various sorts—as iron foundries, machine shops, &c. It has four large warehouses for the sale of leaf tobacco.

Our correspondent adds :

"The Danville and New River railroad is now extended to Patrick Court House, and Martinsville has gained about a thousand inhabitants in the last year or two. The county of Henry has as fine and as great a variety of timber trees as nearly any county in Virginia, with rich land, suited to all kinds of farming and planting, or the raising of cattle or sheep. The county is improving, and is perhaps the finest tobacco county in America. Schools and churches in various parts of the county; graded school at Martinsville."

Iron ore in immense beds, mica, soapstone, chalybeate and alum water are found in Henry.

#### HENRY COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

From Virginia Department Agriculture.

1. *Garnets*, common.
2. *Quartz Crystals*, a group of.
3. *Garnets*, in gneiss.
4. *Magnetite*, from A. N. Price.
5. *Tourmaline*, from A. N. Price.
6. *Mica*, sheets of.
7. *Quartz Crystals*, peculiar group.

The following were collected by E. D. Frazer.

8. *Hematite Iron Ore*, from "Gravely" property, one mile west from Axton station, Danville and New River railroad.
9. *Magnetic Iron Ore*, from "E. Davis" property, near same locality.
10. *Magnetic Iron Ore*, from "Lucy Davis" property, near same locality.
11. *Magnetic Iron Ore*, from "H. P. Davis" property, near same locality.
12. *Magnetic Iron Ore*, from "McDonald" property, near same locality.
13. *Mineral*, from "Koger" property, one mile east from Bull Run, ten miles west from Spencer station, Danville and New River railroad.

14. *Mineral*, from same locality as above.
15. *Steatite*, from "Gravely" quarry, two miles west from Axton station.
16. *Steatite*, from "Barker" quarry, two miles east from Axton station.

## LOUDOUN

was formed in 1757 from Fairfax. It is the northernmost of the Piedmont counties; separated from Maryland by the Potomac river, and by the Blue Ridge from Jefferson county, West Virginia, and from Clarke county, Virginia; Fauquier and Prince William adjoin it on the south and Fairfax on the east.

Within these limits are included 323,013 acres of the finest land to be found in any one county in the State, and it is assessed accordingly at \$8,934,644, which is considerably higher than any other county; value of town lots, \$641,050. Population—white, 16,391; colored, 7,243; total, 23,634.

The surface of Loudoun is varied with mountains, gently sweeping hills and broad valleys, of which the greater part is exceedingly fertile, yielding immense crops of corn, wheat, hay and oats, and supporting great herds of fine cattle and flocks of sheep. Much attention has been paid to improving breeds of horses, cattle and sheep by the wealthy and intelligent farmers of Loudoun.

The Washington, Ohio and Western railroad, which traverses this county, dividing it almost equally, furnishes an outlet for the immense exports of cattle, grain and hay sent from the central portions of Loudoun, and the northern edge of the county is in easy communication with the Washington branch of the Baltimore and Ohio railroad and the Chesapeake and Ohio canal, just across the Potomac.

Leesburg, a fine old town, is the county seat. It has a population of about two thousand.

A good deal of money from abroad has been invested here, but the high price of land has kept out much increase of population by immigration.

The mineral wealth of this county is very considerable—iron, copper, silver, barytes and marble—of which the following specimens were exhibited at the World's Exposition at New Orleans :

1. *Specular Iron Ore*, from near Leesburg, said to be in quantity, from Prof. Fontaine.

2. *Chalcopyrite*, from near Leesburg, said to be a promising vein, from Prof. Fontaine.

The following were contributed by the Eagle Mining Company of Leesburg, F. A. Wise, general manager :

1. *Carbonate of Copper*, from vein 3" wide, developed to 25" deep. Assays by Oxford Copper Company, of New York, give 51 per cent. of copper and 27 ounces of silver per ton.

2. *Sulphuret of Copper*, from vein 10" wide, developed to 50" deep. Assays by Oxford Copper Company of New York give 12½ per cent. of copper.

3. *Iron Ore*, from vein 4" wide and 50" deep. Yields 55 per cent. metallic iron by assay of W. P. Lawver of U. S. Mint.

4. *Sulphuret of Copper*, from vein developed 50". Yields 11 per cent. of copper and one ounce of silver per ton by assay of W. P. Lawver, of U. S. Mint.

5. *Carbonate of Copper*, red oxide and glance, from vein 3" wide, developed to 25" deep. Yields 50 per cent. metallic copper and 27 ounces silver per ton by assays.

6. *Iron Ore*, from vein 2<sup>1</sup> to 4<sup>1</sup> wide, developed 50<sup>1</sup>. Yields 55 per cent. metallic iron.
7. *Oxide of Copper*, from carbonate vein, developed 60<sup>1</sup> on 4<sup>1</sup> wide vein; 25<sup>1</sup> deep.
8. *Sulphuret of Copper*, from vein 8<sup>11</sup> to 15<sup>11</sup> wide, developed 50<sup>1</sup>.
9. *Iron Ore*.
10. *Barytes*, heavy spar, vein undeveloped.
11. *Iron Ore*, from 50<sup>1</sup> level of Eagle Mining Company's shaft.
12. *Marble*, from quarry of "Virginia Marble Company," three miles east from Middleburg. The deposit has been demonstrated to be of great extent; the marble has been pronounced of a very superior quality. Contributed by Major B. P. Noland.
13. *Marble*, from same as above.
14. *Marble*, from same as above.
17. *Copper Ore*, James Pinkham, from Virginia Department of Agriculture.

### MADISON

was formed in 1792 from Culpeper. It is about thirty-three miles long, and contains 266,343 acres of land, assessed at \$1,622,442; value of town lots, \$47,905. Population—white, 6,006; colored, 5,556; total, 11,562.

This is an excellent grass and grain producing county, besides being admirably adapted to fruit and grape culture, and fine tobacco, and containing valuable mineral deposits, as will be seen from the following geological and general sketch of the county—a description so good that it is given unabridged:

"The nature of soils is largely controlled by geological formations, and this is well shown in Madison county.

"An arm of the large secondary formation of the triassic period, which extends from the Rapidan river through Culpeper county and other counties to the Potomac river, extends across the southeastern part of the county, crossing the Robertson river above its mouth, and having a width of one or two miles, where the formation is a red or chocolate-colored shale, the super-imposed soil is of excellent quality, producing fine crops of wheat, corn and grass. Where gray sandstone predominates the soil is of medium fertility, but easily improved.

"It has been recently stated by high authority that soils of similar secondary measures in other parts of Virginia have been found eminently adapted to the growth of high grade tobacco.

"Between this secondary deposit and the Rapidan river the underlying rocks for twelve or more miles are mostly epidote and greenstone, similar to those of the adjacent Southwest Mountain range of Orange county, the decomposition of which furnish potash and lime. The Madison lands adjacent to Orange county appear to be of better quality, owing to some admixture of sand from the adjacent sandstone belt, and furnish in many places soils remarkably well adapted to the culture of grapes, and particularly of the valuable Catawba grape, which it is difficult to raise in many sections.

"The portion of the county lying between the secondary deposits and the region adjacent to the foot-hills of the Blue Ridge mountains is underlaid with gneissoid sandstone, decomposing granites and metamorphic strata, all azoic, and furnishing in disintegration but little lime and potash or other mineral ingredient of value; and the soil, excepting upon the streams, is of medium quality, gray or red color, but readily improved. Adjacent to the foot-hills of the Blue Ridge the

country rocks show marks of the metamorphic or igneous action accompanying the elevation of the Blue Ridge, and produce fertile soils. The slopes of the mountains grow excellent tobacco, potatoes and rye. The Blue Ridge extends along the entire northwest border of the county, throwing out long spurs, some of which nearly attain the height of the parent Ridge—whose highest point in the county is 3,860 feet above sea level. Other points reach 3,600 and 3,400 feet. Average elevation of the Blue Ridge about 3,000 feet. Its top and more elevated slopes furnish excellent grazing when cleared, where cattle thrive well, owing to lower temperature and freedom from annoyance from insects.

"The lower parts of the mountains and the numerous and beautiful valleys and glens are eminently adapted to the growth of grapes, apples and other fruits, where the elevation exceeds 500 feet above sea, and does not exceed 1,500 feet, for in this range of elevation are places where dew and frost are not often seen, and late frost rarely ever injures fruit. No section of Virginia is better adapted to the growth of pippins and other valuable apples.

"The value of lands along the eastern slope of the Blue Ridge, not exceeding 1,500 feet elevation, for fruit raising, does not seem to be properly appreciated when we consider that from absence of late frosts in many places, there is almost uniform success, with proper attention.

"Upon the rivers and creeks in the county are numerous bodies of very rich lands—the largest of these is on the Robertson river near Madison Courthouse, where there are about 1,400 acres in one bottom, mostly very fertile—evidently once the bottom of a lake.

#### MINERALS.

"A large vein of impure graphite crosses the eastern part of the county from the late George W. Clark's farm to the Bond farm on the Rapidan, northwest of Liberty Mills. It makes an excellent fire-proof paint, and very durable crucibles. A vein of yellow ochre accompanies it. Near it runs a large ledge of coarse steatite, which makes hearths and fire-places capable of resisting injury from heat. Occasionally bodies of hematite iron ore are developed along the line of these minerals. North of this, gneissoid sandstone furnishes excellent building stone.

"On the head waters of the Rapidan and Robertson rivers are large seams of magnetic and specular iron ores. Sulphurets of copper are found in very small quantities. The seams of red oxide and native copper appear to be large at some points. They are associated with epidote quartz and greenstone. One vein on Stony Man mountain, worked many years ago, has an apparent width of 15 feet, ores averaging six or seven per cent. of metal. On the Hawksbill mountain a seam, which has not been explored, can be traced by outcrop of the ledge for over half a mile. These ores (if native copper can be called an ore) are found in several other localities, and with the Shenandoah Valley railroad (now built a few miles to the west of the Blue Ridge) furnishing convenient transportation, it is hoped that capitalists will soon develop these mineral deposits, one of which Silliman, Shepherd and other noted mineralogists have declared to have great value.

"The extreme range of the thermometer during the past twenty-five years is from 16 degrees below zero in winter up to 97 degrees in the shade in summer. More generally there is merely sufficient cold weather to furnish ice, and the summers are pleasant, with a bracing air. Malarial diseases are rarely ever seen. All the conditions favorable to longevity prevail.

"The mean temperature of springs taken in June in the southeastern part of

the county is  $58\frac{1}{2}$ ° Fahrenheit, and probably the average of the county would be  $57\frac{1}{2}$ °—the springs near the mountains being colder. As the temperature of springs about corresponds with the yearly mean temperature, we may safely put the average for the county at 58°, which is the mean for Marseilles in France, and Madrid in Spain, and also that of North Carolina."

The Virginia Midland railroad passes near the eastern border of the county, and the Chesapeake and Ohio near the southern line, and the Shenandoah Valley, as stated, is near the western border of the county.

#### MADISON COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

From Professor Fontaine.

1. *Mica Schist*, from near Madison Courthouse; in large quantities—a good building stone.
2. *Diorite*. Occurs in heavy masses with the next.
3. *Diorite*, from an immense dyke, seemingly 1,000 feet wide, in east foot of Blue Ridge on Milan Gap road.
4. *Metamorphic Diorite*, from ledge two and a half miles west from Courthouse, on Milan Gap road.
5. *Variety of Syenite*, that occurs with Unakite at Milan Gap of Blue Ridge.
6. *Variety of Syenite*, that occurs with Unakite at Milan Gap of Blue Ridge.
7. *Unakite*, occurs in Syenite on top of Blue Ridge at Milan Gap.
8. *Unakite*, same place as above.
9. *Magnetic Iron Ore*, from F. H. Hill, C. H., from Virginia Department of Agriculture.

#### NELSON

county extends from James river on the southeast to the summit of the Blue Ridge on the northwest, and lies between Amherst and Albemarle counties on the southwest and northeast. Area, 294,134 acres, assessed at \$1,858,259; value of town lots, \$37,951. Population—white, 9,028; colored, 7,508; total, 16,536.

The surface of the county is rolling, and is crossed by numerous small rivers, creeks and branches. Fresh water is everywhere abundant. The water is mostly freestone, but iron and sulphur water is found in various parts, especially in the uplands along James river. Two railroads intersect the county, the Richmond and Alleghany and Virginia Midland, and the Chesapeake and Ohio touches one end of the county.

Livingston, a village of 300 inhabitants, four miles from the Virginia Midland railroad, is the county seat, and is the largest place in the county. It is 145 miles from Washington.

The soil of Nelson is exceedingly fertile where it has not been too much impoverished by over-cultivation, and even these lands are capable of high improvement at slight expense. The soil is especially suited to the growth of fine and heavy tobacco, corn, wheat, oats, grasses (clover and timothy mostly). Cattle and sheep raising is receiving considerable attention, and pays well. And the same may be said of all kinds of fruits and garden vegetables that are found in this latitude anywhere in the world.

Grapes flourish in this county to perfection, and in the last few years great attention has been paid both by natives and foreigners to the cultivation of grapes and winter-keeping apples, and the results have been most gratifying.

About one-half of this county is in the original growth, which consists of white

oak, pine (white and yellow), Spanish oak, black oak, red oak, hickory, walnut, chestnut, etc., in great abundance, and also other rarer trees, such as ash, gum, sycamore, cherry, locust, in small quantities.

The county is well watered, having the James washing its whole southern border, besides the Tye, Rockfish and their tributaries. These, with the James, along which are numerous solid masonry dams, formerly used by the old canal company, afford an extraordinary amount of water-power, some of the sites possessing advantages equal to any in the State. The minerals of the county are manganese, largely mined at Midway Mills and Warminster (from time to time), rutile, copper (green and blue carbonates), garnet, ochre, kaolin (in immense beds), iron, hematite, specular and magnetic. The Greenway mines have been largely worked and the ore analyzed 65.14 metallic iron, 0.029 phosphorus. Hematite at "Sleepy Hollow Mines" analyzed 53 per cent. metallic iron. A copper mine is being worked near Norwood on the Richmond and Alleghany railroad and is said to be yielding well. These metallic resources are destined to large developments under more favorable auspices than now exist.

The county is penetrated by the Virginia Midland railroad running through its whole width, and the Richmond and Alleghany railroad skirts its entire river border. The Chesapeake and Ohio railway touches the northern corner.

This county offers a fine field for new settlers and investment of capital. The Richmond and Alleghany railroad company offers special inducements to those who buy and settle along its line.

#### NELSON COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Manganese*, from Cabell mine, near Warminster, R. & A. R. R.
2. *Limonite*, brown iron ore, from Sleepy Hollow mine, two miles from Norwood, R. & A. R. R.
3. *Trap-rock*, from dyke, one mile above Norwood.
4. *Mica-Schist*, from Combined Lock station, R. & A. R. R.
5. *Quartz and Feldspar*, from same locality as above.
6. *Magnetite*, magnetic and specular iron ore, from mine near Greenway; a steel ore that has been shipped to Pittsburg.
7. *Tufaceous Quartz*, from Greenway.
8. *Magnetite*, magnetic and specular iron ore, Mundy's mine, near Allen's creek, R. & A. R. R.
9. *Specular Iron Ore*, from Wheatland mine, near Riverville, R. & A. R. R.

From Prof. Fontaine.

10. *Magnetic Iron Ore*, from Moores, near Faber station, Va. Mid. R. R.
11. *Manganese Oxide*, from Simpson's mine, Midway Falls.
12. *Hornblende and Garnet*, in quartzose rock, near Faber Mills.
13. *Rutile*, occurs in gneiss, often in large masses.
14. *Kaolin*, from Dr. J. H. Shelton, from Virginia Department of Agriculture.
15. *Ochrous Clay*, from James Miller.
16. *Copper Ore*, green and blue carbonate, &c., from Rawlings and Armentrout, Staunton.

From the Virginia Midland Railway exhibit.

1. *Iron Ore*, from near Faber station.
2. *Kaolin*, from eight miles from Arrington station.

## ORANGE

was formed in 1734 from Spotsylvania. Its greatest length is thirty-eight miles; the width varies from five to fourteen miles.

Population—white, 6,210; colored, 6,842; total, 13,052. Area, 213,805 acres, valued at \$1,737,804; value of town lots, \$223,054.

It is abundantly watered by the Rapidan and North Anna rivers and their tributaries.

The surface in the eastern part is beautifully undulating; the central and western portions have hills and mountains of gentle elevation, covered to their tops with forests of valuable timber, and farms of unsurpassed beauty and productivity.

The soil is mostly a dark red clay formed from ferruginous and calcareous rocks, and is very fertile, producing large crops of grain and grass, and some tobacco. As a grass-growing and grazing county, this should yield precedence to no other.

The rearing of thoroughbred stock is extensively carried on by careful and intelligent farmers.

The average assessed value of land in this county is \$10.70 per acre, but the improved farms command prices several times greater than that.

The railway facilities are excellent, and are furnished by the Chesapeake and Ohio, Va. Midland, and Orange and Fredericksburg railroads, which are located in such a manner that all parts of the county are convenient to one or another of them.

Gordonsville, near where this county corners with Louisa and Albemarle, at the juncture of the Chesapeake and Ohio and one branch of the Va. Midland road, is the largest town. Orange, the county seat, is a small town on the Va. Midland, at the point of junction of the Fredericksburg Narrow-Gauge road.

The timber consists of large growths of the various kinds of oak, of hickory, pine, chestnut, poplar and sycamore.

Iron ores, red and brown hematite and magnetic are abundant and rich. Limestone, some of it hydraulic, and marble are found at the base of the Southwest mountains. Gold-bearing quartz, asbestos and fire-clay are found in Orange.

Our correspondent adds :

“Orange county, one of the central districts of Piedmont Virginia, embraces all of the advantages conceded to that favored section, viz.: great diversity of agricultural production, abundant pure spring water, embracing numerous chalybeate springs, freedom from malaria, pure mountain air and ready access to the best markets. The Southwest mountain range traversing the entire length of the county, defining the line between the red and gray lands and forming the water shed to the Rapidan on the northwest and the North Anna river on the south, gives the elevation which, with the deep soil and natural drainage, renders this section, embracing more than half the area of the county, peculiarly adapted to the growth of grapes, apples, cherries and all standard varieties of fruit, and as grazing lands, especially for sheep, second to none outside of the blue-grass region. As evidence of the adaptation of this section to general stock raising, statistics show more pure-bred stock, embracing representatives of nearly all the leading breeds of cattle, sheep and hogs, exhibited at the Virginia State fair from this county than from any other in the State. The average production per acre of the staple crops is of wheat, 15 bushels; oats, 20 bushels; corn, 30 bushels; tobacco, 800 pounds. Colored labor is abundant at \$100 to \$120 by the year, with board, house and garden and firewood; or 50 cents per day, with board, for first-class men.

"The general system of farming is progressive, and the adoption of the 'diversity of production' is meeting with general favor. The raising of small fruits for the Northern markets is a rapidly increasing and profitable industry. 30,000 pounds table grapes were shipped this season from one express office, notwithstanding the unprecedented bad season. The public schools, supplemented by numerous private schools, afford abundant educational facilities. Land can be bought at from \$10 to \$40 per acre and settlers are cordially welcomed."

#### ORANGE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Collection of the Va. Midland Railway.

1. *Iron Ore*, from Madison station, from W. P. Hicks.
2. *Iron Ore*, from same locality, from Reid & Wallace.
3. *Terra Cotta Clay*, from same locality, from Reid & Wallace.
4. *Yellow Ochre*, iron paint, from same locality, from Reid & Wallace.
5. *Iron Ore*, from "Falkner" land, one mile from Madison station, from Glass & Co.
6. *Iron Ore*, from "Taylor" Mine, near courthouse, from Ben. Rawlings.

From the Virginia Department of Agriculture.

1. *Red Iron Ore*, micaceous, from J. C. Harrison, Barboursville.
2. *Red Iron Ore*, from H. C. Baker.
3. *Brown Iron Ore*, from Erasmus Taylor.
4. *Slate*, from Erasmus Taylor.

#### PATRICK.

This is the extreme southwestern county of the Piedmont section. It borders on the North Carolina line. Until very recently it was cut off from the world, having no means of communication, except the ordinary dirt road. Its area is 378,169 acres, assessed at \$938,101; value of town lots, \$53,560. This low price is due to the cause above alluded to and to the fact that 63 per cent. of the land is woodland. Large tracts have never been settled up.

Population—white, 10,099; colored, 2,734; total, 12,833.

The lands are watered by the Dan, and Smith's river, a large tributary to the Dan, and other streams. A part of this county is hilly or semi-mountainous, but there is a large plateau, called "The Meadows of Dan," which is well adapted to grass.

A correspondent from this county writes as follows:

"Some, and, in fact, most of the lands of this county produce fine crops of corn, wheat, rye, oats, potatoes (Irish and sweet), tobacco, and grass making a superior hay. We now have in this county considerable tracts of land in primitive forest, which is for sale, and would bring as fine tobacco and wheat as ever grew anywhere. Fruits grow and mature finely here. We have very fine apples, in endless variety, ripening from June to November. Now, while I write, August 24th, I hold in my left hand a sound apple, grown in 1885, and kept in open air through winter, spring and summer. Peaches do well, all that is needed being to destroy the worm which bores in the roots and kills the trees at three or four years old. Cherries are very fine. Grapes grow luxuriantly in almost all parts of the county; the native grape, without any attention, grows abundantly, and almost any of the

improved grapes, when cultivated, do remarkably well. I have tried the Delaware, Isabella, Catawba, Norton's Virginia, and have seen several other kinds growing and bearing luxuriantly and abundantly.

"Much of our land is fertile and brings fine corn, some as high as fifty bushels to the acre. Buckwheat grows and yields abundantly. As to vegetables, we have them in almost perfection—turnips, cabbages, onions, parsnips, carrots, squashes, etc."

The timber of this county is very abundant and of fine quality. The county is also famous for apples and the abundance of small fruits which grow wild.

The minerals are iron—of the finest quality—lead and silver. During the war this iron was worked by the Confederate government.

Very recently the Danville and New River railroad has been completed to Stuart, the county seat. This is the only village of note in the county.

This county offers the greatest inducements to settlers on account of cheap lands and probable rapid growth. Large bodies of land can be bought at low figures.

#### PATRICK COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Virginia Department of Agriculture.

1. *Hornblende.*
2. *Magnetic Iron Ore*, from Judge Lybrook.
3. *Copper Ore*, low grade.
4. *Steatite.*
5. *Mica.*
6. *Limonite.*

The following were collected by Mr. E. D. Frazer.

7. *Magnetic*, from "Floyd" mine.
8. *Hematite*, from "Moris" mine.
9. *Hematite*, from "Nowlin" mine.
10. *Magnetite*, from Barksdale furnace property.
11. *Magnetite*, from same locality.
12. *Magnetite*, from "Hairston" mines.
13. *Magnetite*, from "Forley" mines.

#### RAPPAHANNOCK.

This county lies on the Upper Rappahannock river, which divides it from Fanquier county. Its surface is high and hilly, but is fine grazing land. Its area is 150,265 acres, of which thirty-one per cent. is woodland, assessed at \$1,587,527; value of town lots, \$75,365; a high average, considering that no railroad or navigable waterway is found in the county.

Population—white, 5,755; colored, 3,536; total, 9,291.

It is well watered by the Rappahannock river and its tributaries.

Washington, the county seat, is near the centre of the county. Besides this there are the considerable villages of Flint Hill, Woodville, Sperryville and Amissville. At the latter place there is a large tannery. Many fine cattle and horses are carried to market from this county.

Efforts have been made to construct a railroad into this county by a branch

road from the Virginia Midland at Warrenton or Culpeper, which will doubtless be done before long.

Although off the railroad, this fine county offers great inducements to settlers in its fine lands, salubrious climate and beautiful scenery, and the grazier is practically not far from the great markets of the country. The Shenandoah Valley railroad runs within five miles of the western border, through the fine counties of Page and Warren, and affords transportation to a considerable portion of the products of this county.

## SHENANDOAH VALLEY.

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### THE VALLEY

is a portion of the great Central Appalachian Valley that extends for hundreds of miles, from Canada to Alabama—a broad belt of rolling country, enclosed between lofty mountain ranges, diversified by hills and valleys, with many winding streams of water—the Blue Ridge on the east and the Kittatinny or Endless mountains on the west. This is a region of limestone rock, shales, slates and clays.

The lowest point of the Shenandoah Valley is at Harpers Ferry, in (now) West Virginia. The lowest or most northern county in Virginia is Frederick, the highest is Augusta, respectively 242 and 1,863 feet above tidewater. The length of the Shenandoah Valley in Virginia is 136 miles.

In this space are seven counties. The lowest is Frederick, then Clarke, Shenandoah, Warren, Page, Rockingham and Augusta. In the latter county are the head springs of the Shenandoah river.

A large portion of the Valley was settled by Pennsylvania Germans in the early history of the State. These people brought with them their frugal habits, their conservative systems and modes of farm management, which served to keep it what nature made it to be—one of the most desirable tracts of country in the United States.

The Valley is the region of cambrian and lower silurian rocks—Formations, I, II and III of Rogers, or from Potsdam to Hudson river formations of New York inclusive—a country mainly of limestone, slate and shale rock, with a fertile soil and undulating surface. The section across the Valley through Staunton gives some thirty alternating bands of slates and limestones of various kinds, some magnesian, others silicious or rich carbonates; some compact, others flaggy or slaty, &c. Among these are beds of chert, iron ore, umber, &c. This formation extends northward, and forms the rich Cumberland, Lebanon and other Valleys of Maryland, Pennsylvania and New Jersey, the Hudson and Mohawk Valleys of New York, and the Champlain Valley of Vermont. Southwest it becomes the Valley of East Tennessee, and extends into Alabama, making a grand Central Valley, some 1,500 miles in length, of unsurpassed fertility and productiveness. This formation underlies a large portion of Scotland, especially the southern and central parts; much of the area of Wales, and large districts in the west, southwest and northwest of England. The most fertile portions of New York, Ohio, Indiana, Kentucky, Wisconsin and Missouri are also underlaid by this rock.

To the Division we are describing will, politically, belong parts of the Upper Silurian and Devonian systems, that are more specially referred to in the account of the Appalachian country. These form long ridges that rise up and run for

great distances in the Valley, like the Massanutten and other mountain ranges that divide the great Valley lengthways into two parallel valleys. The rocks of the Valley generally dip both ways, to the southeast and to the northwest, making an anticlinal. The upturned edge of the rocks strikes or runs northeast and southwest with the Valley. Fragments of the sub-carboniferous formation are found along the western margin of the Valley, sometimes containing beds of semi-anthracite coal.

#### MINERALS.

*Iron ore*, brown hematites, are found in "pockets" in all portions of the Valley. These supply large quantities of fine ores. Umber exists in many places. Ochre is worked successfully in Page county. In the mountain ranges that rise up in the Valley are very extensive beds of several varieties of iron ores. The Valley limestone makes an excellent *flux* for iron. The large deposits of *pure kaolin* in Augusta county, have been used in the manufacture of "stone china" and "Rockingham" wares, and is now made into pipes, tiles, &c.

#### SOILS.

The soils of the Valley are quite numerous; they are generally called *limestone soils*, as this is a limestone region. The prevailing soil is a stiff, clayey loam—a durable and fertile soil, well adapted to the growth of grass and grain. In the silty belts the admixture of the decomposed aluminous rocks makes a lighter and warmer soil. There are also belts of sandy or gravelly soil that are cold and require cultivation and fertilizing to make them productive, but once redeemed they yield very well. Much of the larger portion of the Valley has naturally a good soil, rich in the elements of fertility. The soil, like the rock, runs in belts with the Valley, and the lean ones are the smaller number. The streams, as in all limestone regions, are winding, so there is here a considerable area of bottom lands. Washington said of this section that "in soil, climate and productions, in my opinion, it will be considered, if not considered so already, as the Garden of America."

Here we find the natural *blue-grass lands*, the home of the stock-raiser and dairy-man; the *heavy clay lands*, fat in fertilizing ingredients, always repaying the labor spent on them in crops of corn or other grain; the light silty lands, famous for wheat crops; the poorer *ridge lands*, where sheep rearing should be followed.

#### TRANSPORTATION FACILITIES.

The Valley is well supplied with railway facilities—every county having one or more railroads.

1st. The Valley Branch of the Baltimore and Ohio railroad from Harper's Ferry (West Va.) traverses the whole length of Frederick, passing by Winchester, its chief town, then traverses Shenandoah county, forming a junction at Strasburg with the Manassas branch of the Virginia Midland railroad, then through Rockingham to Staunton, in Augusta, where it crosses the line of the Chesapeake and Ohio railway running east and west, thence through Augusta to Lexington, in Rockbridge county, its present terminus.

Parallel with this line the Shenandoah Valley railroad, from Hagerstown, Maryland, runs throughout the whole Valley, striking Clarke county near Berryville, thence through Clarke and Warren. At Riverton it intersects the Manassas

branch of the Virginia Midland railway; thence through Page, Rockingham and Augusta counties. In the latter it intersects the Chesapeake and Ohio railway at Waynesboro.

The latter railway traverses Augusta county from east to west, striking Staunton, its county seat and the largest city of the Valley.

It will thus appear that few sections have superior facilities for transportation of persons and property than this Valley.

#### CITIES AND TOWNS.

Staunton, Winchester, Harrisonburg, Woodstock and Berryville are the chief cities and towns in this part of the Valley. These will be described more particularly under the head of the counties in which they lie.

#### THE "VALLEY" COUNTIES, SOUTH OF AUGUSTA

The economic as well as the scientific geology of the counties of "The Valley" here treated presents remarkable general similarity in the order of arrangement throughout; but the departures from absolute uniformity are, in some localities, quite considerable.

This series of unusually rich agricultural and mineral counties: Botetourt, Roanoke, Montgomery, Pulaski, Wythe, Smyth and Washington, with a small triangular piece of Scott county, extend from north of James river to the Tennessee State line. It is bounded southeast by the archæan and primordial rocks of the Blue Ridge and the more westerly limb of its bifurcation; and on the northwest side are the Upper Silurian and Devonian rocks of the great North mountains, trending generally northeast and southwest, under such names as Gap and Walker's mountains, and for a part of the way the boundary is Clinch mountain, with the same formations.

The main central portion of the Valley is composed of Cambrian and Lower Silurian limestones, calcareous and ferriferous shales, &c., to the decomposition of which, *in situ*, "The Valley" not only owes its great fertility as a grass and grain producing region, but some of its valuable beds of iron ores are thought to be thus derived. Then, this central limestone belt is flanked on the northwest by a not inconsiderable, and sometimes quite valuable, band of the earliest coal rocks, yielding here and there excellent semi-bituminous and semi-anthracite coals, in beds varying between  $2\frac{1}{2}$  and 20 feet in thickness—all in "The Valley." The grass that naturally coats the soils, when the timber is removed, is the famous "Kentucky Blue-Grass" (*poa-pratensis*); and when the land gets down somewhat, from bad cultivation, this is often replaced by another species of blue-grass (*poa-compressa*), more truly blue in appearance than the more valuable kind first mentioned.

The different sub-divisions of geological formations are found in these counties to read in faulted sections; beginning on the southeast in the later sub-epochs of the archæan age, and pursuing the reading northwest, over a great fault on the northern or northwestern side of the Valley, through a down throw of proto-carboniferous rocks, to the Devonian and Upper Silurian of the great North mountains—in such order and with such modifications as may be shown later on.

Those thrusts of pressure, evidently projected from southeast toward northwest, which were exerted in folding and faulting the earth's surface throughout this region, so acted upon the Blue Ridge as to elevate that range, not only much higher at one time than it now is, but really overturned, some degrees beyond the

perpendicular, much of its stratification; so that we often see the Huronian rocks, which theoretically belong nearer the heart or toward the south slope of the mountain, pressed over, with their valuable gold, tin, silver, copper, magnetic and specular iron ores, to the "Valley" side of the mountain. Thus, in the southeast of Botetourt tin ores may yet be found, as they are now reported to have been discovered on Bent mountain, in Montgomery, and on the southwest side of Roanoke county. In Montgomery county, on Brush creek, gold has not only been found in that arm of the Blue Ridge, or Pilot mountain, but companies are now preparing to erect works for its reduction from the quartz to which it has been traced. The gold-bearing rocks must have been there identified as being of greater thickness and persistency than was at first believed possible. This is also true of the region of Little River, somewhat farther southwest. It would not be surprising to hear of the discovery of tin and gold both in the southern sides of Pulaski, Wythe, Smyth and Washington. These valuable Huronian strata, which also yield much valuable red iron ore, are succeeded, next northwardly, by the Potsdam or Primordial rocks, which show the first positively ascertained evidences of organic life, in fossil remains of the *Scolithus Linearis* and certain ancient *fucoids*. In these rocks, which extend generally along the northern base of the Blue Ridge, in its straight continuations, are found, besides excellent glass sand, three or more of the most massive, persistent and valuable iron ore deposits ever found in Virginia. The ore is usually a Limonite, often largely mixed with specular ore and oxide of manganese, and found in quite accessible bodies, measuring from 20 feet to 150 feet and more in thickness, between their enclosing walls. From numerous openings on this line of deposits, in these counties, the ores have been largely mined and converted into iron at various furnaces. From both sides of the anticlinal ridge of Potsdam rocks in Botetourt county, lying between the Norfolk and Western and Shenandoah Valley railways, a large tonnage is annually removed from the Houston, Munford and other mines, and reduced in the Crozet furnace at Roanoke city.

These vast lines of Potsdam ores make large exhibits on the southern side of Roanoke county; in Montgomery county, on Bent mountain, Pilot mountain, Little river, &c.; in Pulaski county, on Laurel creek, at Radford furnace, Calfee's, on New river, and at other places; in Wythe county, on the side of Poplar Camp mountain, on Francis Mill creek, where one deposit is over 100 feet between walls, and at numerous other places in Iron mountain, besides being found largely developed on both sides of Lick mountain, an anticlinal of Potsdam rocks in the centre of the county; in Smyth county, at Alexander, Neitch and Rowlands on spurs of Iron mountain, where it sometimes develops as a red iron ore of high grade, at Grose's and other places in Iron mountain, besides many extensive and valuable deposits in White Rock and Glade mountains in the middle of the county; in Washington county, on spurs of Iron and Holston mountains in extensive deposits, sometimes accompanied with red hematite.

From numerous openings in all the places mentioned, Prof. A. S. McCreath, chemist, and others have carefully selected and analyzed samples, from which it is inferred that the metallic iron in these Potsdam ores varies from 50 to 56 per cent.; silica, 3 to 10 per cent., and phosphorus, 0.138 and higher.

Dr. Frehling, chemist, of Richmond, in those of Lick mountain, finds in seven samples an average of metallic iron, 52.210; metallic manganese, 1.491; phosphorus, 0.216; some phosphorus assays being as low as 0.039, the highest being 0.508 per cent. Much of the red iron ore found in the Potsdam rocks averages 56 per cent. metallic iron and 0.040 phosphorus, particularly that in Smyth county.

The manganese ore so far reported as accompanying these iron ore deposits is in veins or deposits of two to eight feet thickness, and much of it is of the standard percentage required by commerce. It has been discovered in every county where Potsdam rocks are found.

This great band of Potsdam or primordial rocks presenting its sometimes folded outercrop generally to view, on the western lower flank of the Blue Ridge, is the great floor or bed rock—the corner-stone, so to speak, of the great paleozoic series. Not far above it, in the order of natural superposition, is that equally valuable band of dolomitic limestones, some ledges of which yield the excellent cement of James river, and farther southwest, the extraordinary deposits of lead and zinc ores, the floor and roof of which are composed of the famous bands of brown iron ores of the *New river—Cripple creek—basin*, so much sought after for car wheel purposes. While all the Valley counties may, after exhaustive research, reveal the presence of these zinc and lead ores of No. II, it is not until you reach Roanoke county that any appreciable thickness of them has been so far reported. Here, three miles south of Roanoke city, the analysis of Dr. Gascoyne, State chemist, reveals not only a high percentage of zinc and lead, in one small sample, but \$15 in silver to the ton. Another sample sent west for assay returned \$25.00 to the ton in silver.

Then, again, in Montgomery county, it is found at Langhorne's, above Big Spring and near the north flank of Pilot mountain (Blue Ridge, western limb); also at Calfee's, near Little river. In Pulaski some of the rocks at Pepper's ferry show it. At Calfee's, four miles below Reed Island creek, and on the opposite bank of New river, lower down, in a cliff. Then, proceeding southwest, these great measures not only spread out laterally, but thicken vertically, so that when you reach Bertha and Falling Cliff Zinc mines of Wythe county the deposit is at least 200 feet from floor to roof, and more than 1,800 feet wide—almost wholly a pure zinc ore, existing as a silico-carbonate, from which a metal is made at the smelting works, now in operation at Pulaski station, N. & W. railroad, yielding the following, by the analysis of Dr. P. de P. Ricketts: Metallic zinc, 99.9629; iron, 0.0371; lead, none. Then, again, prominently at the old Wythe Lead and Zinc mines, on New river, same county, where it exists in beds of 50 feet thickness and over, as blonde and galena, below the zone of decomposition. These latter works have been in operation since long before the Revolutionary War—probably since about 1756—supplying lead to the heroes of '76, and nine-tenths of that used by the Confederates in the late war. These mines have sold to reducing works, on the seaboard, over 30,000 tons of zinc silicates, carbonates and silico-carbonates of a high order of purity, and now manufacture into shot and pig-lead 1,500 to 2,000 tons of lead annually. Then, again, a few miles farther southwest, same county, near Ivanhoe Furnace and Painters, the same extensive bands of zinc and lead exist, accompanied on one side with barytes. At other places, pursuing this basin of Cripple creek southwest, these deposits are exposed in Wythe and Smyth counties—as at James', Wythe, and at Alexander, Neitch & Rowland's, in Smyth county, on Comers creek, Preston's and others; and then, becoming less in thickness, seem to disappear from the rocks in Washington county to make their appearance again in Tennessee. Nearly along with this great band of rocks, as at Mock's Mills, in Washington and other places, are deposits of handsome onyx-like travertine marble.

With the vast deposits of lead and zinc, above described, there are much thicker bands of ear-wheel iron ores just above and below them, showing their greatest development in Pulaski and Wythe counties, so far as explored. In Wythe this

whole stratification is over 900 feet thick, from floor to roof (ores and limestone occupying separate spaces in the same stratification) and spreads out over two and a half miles in width in the New river—Cripple creek—basin, the brown iron ores being accompanied with valuable quantities of magnetic shot ores and red hematites. It is upon this line of inexhaustible ores, extending from below the Clark Bank, in Pulaski, through Rich Hill and the intervening beds of Graham and Robinson and others, in Wythe county, to the famous Cregger Bank, on Cripple creek and above that point, that the twenty-one furnaces and forges of that region are built, where, it is now said, that by the use of coke as a fuel, iron can be made at \$9.50 per ton, it being necessary to use there less than 500 pounds of limestone to the ton of metal produced. Farther southwest, in Smyth and Washington, these ores also show on south fork of Holston river, losing there in thickness, but changing to red hematites and semi-magnetites of a high order.

As to a close chemical determination of these ores an average of seventeen samples gave Prof. McCreath, metallic iron, 54.514; phosphorus, 0.106; siliceous matter, 7.094 per cent. Other chemists, such as Dr. Brown, Dr. Froehling, and others, found many averages, some of which may be possibly just within the limits required for Bessemer purposes. In a few instances, as with the assays of McCreath, the ores of Rich Hill and Ivanhoe were found within the Bessemer standard. The Smyth and Washington county red hematites and semi-magnetites of this zone were found by assay to yield 60 per cent. of metallic iron and 0.049 phosphorus.

Next in order follow the great body of limestones of the "Valley," interstratified with sandstones, shales, slates and thin beds of iron ores—the sandstones, shales, &c., rarely ever assuming large dimensions, when compared with the limestones as a whole. This regularity of these bands is sometimes interrupted by the intrusion, from one side or the other, of the Valley's lateral or marginal rocks that belong higher or lower in the geological scale. In Botetourt and Roanoke, in the instances of Purgatory, Mill, Tinker's, and Fort Lewis mountains, the great limestones of III are out of sight beneath great cross *flexures* from the north side of immense bodies of rocks of the upper Silurian, Devonian, and proto-carboniferous periods, chiefly sandstones, slates, heavy bands of iron ores of V to VII (R), and beds of coal of a broken character, as that near Tinker's mountain. This is also true, in a measure, of Draper's mountain and the region just north of it, in Pulaski and Wythe counties, where the middle of the Valley is occupied by the rocks of V to VII (R), &c., and the region just north along Peak creek, by proto-carboniferous strata, with really valuable coal veins. While in Wythe and Smyth counties, over definite areas, the great Valley limestones are, on the contrary, protruded and lost by an up-throw of the great Potsdam floor with its iron and mauganese ores;—as is the case in Lick mountain in Wythe, and Glade and other moutains in Smyth county.

With these general exceptions, the great Valley limestones are the marked geological features of the "Valley." Occasionally they assume the character of marble; again, they are so impregnated with magnesia as to become a source for the manufacture of hydraulic lime. From numerous samples, carefully tested by Prof. Wm. B. Rogers, he concluded that beds of magnesian limestones, suitable for making hydraulic lime or cement, exists in Botetourt, Roanoke, Montgomery, Wythe, Smyth and Washington; and subsequent inspection proves their existence in all the Valley counties here treated. For cement purposes, the carbonate of magnesia should be found to exist in the stone as compared to carbonate of lime in a proportion of two to three. For a pure and good limestone, suitable for making a good quality of lime, probably the dark blue limestone, of which there

is so much in all these counties, has no superior. It usually contain about 82 to 85 per cent. of carbonate of lime, according to Prof. Rogers, and yields 47 per cent. of lime, when properly burnt. There are many ledges of very dark limestone, passing near many of the courthouses, which are situated about the middle of the Valley, which, when polished, have the appearance of black marble of fine texture.

In addition to these uses mentioned, the gray and darker limestone ledges of sufficient thickness, of which there are many, are employed universally in building every description of masonry—houses, foundations, bridges, walls, &c. To all these valuable features must be added the many large and constant springs that flow from the limestone strata—many of them of a thermal character of excellent merit.

Then, as you enter the line of purely Trenton limestones, usually just northwest of the middle of the Valley, there is a persistent ledge of chert in all the counties, which, at intervals, presents to view large bodies of a semi-magnetic iron ore of great purity and possible usefulness; at several points in Botetourt, Roanoke (near Red Sulphur Springs), Montgomery, Wythe, Smyth and Washington (at Gallahers & Tilson's), yielding often over 60 per cent. of met. iron and about 0.038 phosphorus. Along and near to these rocks are valuable and extensive deposits of barytes—found in large bodies in Smyth and other counties.

Beyond this line northwest is a line of No. IV limestones, which yield excellent variegated marbles, and may be found in nearly all the counties where the order of position is not broken by cross flexures.

In this line are large deposits also of brown iron ores; and then, as you approach the northern margin of the Valley, a fault occurs, which brings a downthrow of sub-carboniferous rocks against the rocks just described.

In fact, on that side, in all the southwestern counties, there is a much wider margin of sub-carboniferous rocks than had hitherto been accredited to the region. In this line of rocks, the coal just north of Catawba creek, in Botetourt, is found; that in Roanoke, on Tinker's creek, and in Brushy, near Roanoke Red Sulphur Springs; in Montgomery county, at Prices mountain, on both sides of the anticline, and in Brushy mountain, in deposits over 7 feet thick; in Pulaski, at Tyler's Belle Hampton mine, at Altoona mines, in two veins of 21-3 feet thick, and in much of that region in Pulaski, extending from Pulaski station, westwardly along the Norfolk and Western railroad to the Wythe county line, on both sides of the railroad.

In Wythe county this coal exists in Little Brushy mountain through its entire length in the county, as at Stony Fork and other places, and comes up near Clark's Summit and Max Meadows in a repetition of the strata in valuable deposits. In Smyth county it is also observed on the north margin of both the great Valley and Holston valley, north of the gypsum beds. Overlying the coal beds, geologically, is a band of gray and red shales and sandstones, separated from the coal by valuable deposits of iron ore; and over the red shales are limestones of some thickness, in which are very extensive deposits of iron ores. The sandstones of the belt yield a ledge or two, excellent for building purposes; being also soft in quarry are easily mined, while just under the coal is a band of excellent fire-proof sandstones, proven good, also, in use, as grindstone grit.

Along this general line (about the fault) are some of the great mineral springs of these counties, such as: Botetourt springs, Roanoke Red Sulphur springs, Montgomery Yellow and White Sulphur springs, Chilhowie springs of Smyth, Washington springs near Glade spring, and the Seven springs of Washington

county, from which is made the valuable Seven springs iron and alum mass; Mangel's springs of Washington, and Holston springs of Scott county; while Alleghany springs of Montgomery county are situated south of the great lead and zinc zone, and Daggers springs of Botetourt are in a line far to the north.

Then, the last to be mentioned, but far from the least of the Valley's features, are the gypsum and salt of the north fork of Holston river, in Smyth and Washington counties. They lie along the north side of the great fault that marks the line of that fork of Holston river, and are really a part of the sub-carboniferous system of rocks.

This massive deposit of gypsum, more than 600 feet thick, at Stuart and Buchanan's Cove, in Smyth county, shows conspicuously; also, at the Pearson Beds, and at Saltville, in Smyth county, and at Buena Vista, in Washington county. Many explorations and long continued examinations lead to the belief, at last, that these vast gypsum deposits, showing for about 20 miles in length, really compose two or more regular strata of the sub-carboniferous rocks, and have a width, exposed and concealed, of one mile or more from the fault northward. It has been mined to a depth of about 180 feet at Saltville and Buena Vista, and its general composition by analysis is as follows: Lime, 32.50; sulphuric acid, 46.50, and water, 20.50, showing traces of magnesia, alumina and iron.

The rock at Saltville, possibly 200 feet thick by an unknown length, may have a different origin from that of the gypsum—possibly may be due to deposition in a secure basin, from brines flowing constantly from the salt-bearing groups of rocks known to be in the sub-carboniferous series. The brines are of an unusual degree of purity; have been drawn upon for many years by the salt works of Saltville, making over 500,000 bushels of salt annually, without any appreciable diminution of either strength or quantity. Railway communication is now by means of the Norfolk and Western railway—the upper or Buchanan and Pearson plaster deposits having railway communication. Altogether, "the Valley" presents no more wonderful feature! With unlimited basins of gypsum and salt, inexhaustible deposits of iron, lead, zinc and coal, inconceivably vast ledges of limestone, whose unequal solubility here and there have resulted in caves of marvelous beauty; thermal and medicinal springs of high therapeutical and curative value; an atmosphere of wonderful purity and power of invigoration, and a soil of great fertility, it may well be anticipated that "*The Valley*," besides becoming the home of extensive and varied industries, will be a sanitarium more numerously attended in the future, and is now a granary of unlimited natural capacity.

Before dismissing "the Valley Division," it may be well to call attention to its great capacity as a fruit producer. Its orchards and gardens show that all fruits common to this latitude not only flourish well, but yield largely, with fewer average failures than is common in many other localities.

## COUNTIES OF THE GREAT VALLEY.

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### NATURAL SUB-DIVISIONS.

### COUNTIES.

The Shenandoah Valley.....	{ Frederick. Clarke. Warren. Shenandoah. Page. Rockingham. Augusta.
The James River Valley.....	{ Rockbridge. Botetourt.
The Roanoke Valley.....	{ Roanoke.
The New River or Kanawha .....	{ Montgomery. Pulaski. Wythe.
The Holston or Tennessee Valley.....	{ Smyth. Washington.

## VALLEY BY COUNTIES.

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### AUGUSTA

is chief among the counties of the famous "Valley of Virginia," second in size, containing more than a thousand square miles=628,849 acres, assessed at \$8,597,269; value of town lots, \$190,586; and first in population, containing 35,703—white, 26,393; colored, 9,310. The surface is uneven and mountainous on its east and west boundaries, which are respectively the Blue Ridge and "Great North" mountains, an outlying range of the Appalachian chain. The valleys between these mountains are extensive and very fertile, embracing the head waters of the Shenandoah river and that part of the "Valley of Virginia" at its greatest width. It is about thirty-five miles long and thirty wide, with an undulating surface, abounding in hills, fertile and well watered valleys, with fine water-power.

Augusta has a variety of soils, producing wheat, corn, oats, rye, barley, buckwheat, potatoes, turnips, beets, &c.; also the various grasses for hay and pasture. This county is noted for its fine horses, fine cattle, hogs and sheep, the latter having greatly increased and improved since the enactment of a "dog law" for their protection. This county is notable also for the number and excellence of its flouring mills, propelled by the finest water-power.

There are many mineral springs of excellent water of their kinds, among them the Stribling Springs, the Variety, Crawford, the Lone Fountain, Chalybeate, Lithia, &c., consisting of a great variety of waters, much esteemed by the people and much resorted to by strangers. Many minerals are found in this county, such as iron ore (brown hematite and specular), maunganese in large quantities (which is mined), marble, kaolin, with a large factory awaiting capital to operate it, and coal of an anthracite character.\*

There are six or more iron furnaces, besides a considerable number of forges, which have been operated in this county on the vast deposits of iron ores, and they are making iron cheaper than it can be made North and West. The various fruits of this section succeed admirably in this county.

Timber: oaks of the several kinds, white oak being very abundant and of

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\* Mr. Charles Grattan, Superintendent of Schools, who has written me a very excellent description of Augusta, and from which I have obtained some of the above information, says of this coal: "At Dora, where a shaft has been sunk, coal is taken out not inferior to the best Pennsylvania anthracite, is wagoned eighteen miles, and undersells the Northern coal. There is no doubt North Mountain is full of it." I regret that want of space prevents me from publishing Mr. Grattan's letter in full.

superior quality, hickory, chestnut, walnut, poplar, maple, beech, dog-wood, white ash, locust, pine (white and yellow), cedar, &c. Tanner's bark may be had in large quantities, and staves, hoop-poles, &c.

The Chesapeake and Ohio railroad passes through the county, and is intersected at Staunton by the Valley branch of the Baltimore and Ohio railroad, connecting it with Baltimore in nine hours and with Washington in seven hours. And the macadamized "Valley Pike," an excellent road, gives ready communication to various markets east, west and north. The Shenandoah Valley railroad also passes through the county, crossing the Chesapeake and Ohio railroad at Waynesboro. Thus the county is traversed by three great lines of railroad, one from east to west and two from north to south.

The capital or county seat of Augusta is Staunton. Here is the point of intersection of two trunk lines of railroads, viz: The Chesapeake and Ohio and the Valley branch of the Baltimore and Ohio railroads. Here are the Western Lunatic Asylum, and the Asylum for the Deaf, Dumb and Blind. Also four prosperous female colleges, viz: The Virginia Female Institute (Episcopal); the Wesleyan Female College (Methodist); the Augusta Female Seminary (Presbyterian); and the Staunton Female Seminary (Lutheran). Here also are an iron foundry, wagon and implement factories, and numerous shops, banks, and churches of all leading denominations. An annual Agricultural Fair is held here.

There are many small towns and villages in the county. Waynesboro, at junction of the Shenandoah Valley and the Chesapeake and Ohio railroad, is well situated. The county is well supplied with churches and schools. If Augusta county had the same density of population as Rhode Island, it would sustain 272,000 people, and it is well able to do so.

The people of Augusta are intelligent, industrious, thrifty, sober, economical and homogeneous, being largely of Scotch-Irish parentage.

Through the county stretches a band of *magnesian* limestone, and it is found near Weyer's Cave, west of Waynesboro, northwest of Staunton, near the base of Little North mountain, and numerous other places. Its *hydraulic* character has been well tested. This cement has recently been found on the farm of John L. Peyton, and is pronounced by competent judges a first-class article. This limestone, from which *hydraulic cement* is made by burning, constitutes an important part of the formation of the Valley, both from its extent and economical value. It is usually of bluish gray, sometimes blended with yellow or brown, and sometimes dark blue, but the best guide to its recognition is the *dullness* of the surface even when freshly broken, and the absence of fine grain of most limestones. Those in Augusta contain about from 44 to 53 per cent. of carbonate lime, and 33 to 35 per cent. carbonate magnesia, and 2 to 7 of silica. The other constituents are generally alumina and oxide of iron in moderate proportions. A New York marble firm leased the Craigsville marble quarry in this county (encrinial marble, now in much demand), and have worked it largely; the deposit is believed to be inexhaustible. The marble is represented as being very superior, finishing up in beautiful style, being more durable and smoother than the Tennessee marble, and equal to much of the Italian marble which is used on the finest furniture. A quarry of superior slate has been opened north of Staunton. These slate quarries are largely worked now, and are turning out mantels, hearths, wainscoting, steps, &c. The farmers have a fine home market in the city of Staunton, with its numerous schools, manufactories, and the State institutions, which alone disburse \$100,000 annually.

Augusta county was represented at the New Orleans Exposition in her mineral resources by the following specimens :

From Professor Fontaine.

1. *Brown Hematite Iron Ore*, from Kennedy tract, foot of Blue Ridge.
2. *Jointed Sandstone*, from Blue Ridge, near Black Rock spring.
3. *Ochre*, from Samuel Steele's, near Fishersville, in large amounts.
4. *Mica Slate*, with clorite spots, from west end of Rockfish Gap tunnel, in considerable amounts.
5. *Stalactitic Marble*, from near Greenville.
6. *Quartz Crystals*, from near Waynesboro.
7. *Ochre*, from Samuel Steele's, in large quantities.
8. *Manganese*, from Fauver beds,  $1\frac{1}{2}$  miles from Vesuvius station, Shenandoah Valley railroad.
9. *Brown Hematite Iron Ore*, from same locality.
10. *Ochre*, from Samuel Steele's, near Fishersville.
11. *Brown Iron Ore*, limonite, fibrous, radiated; two lumps of 50 pounds each, from mine bank in Potsdam, No. 1, near head of south river of the James in Blue Ridge.
12. *Iron Ore*, brown hematite and red shale, from mines of Buffalo Gap furnace.
13. *Pig Iron*, from Buffalo Gap furnace.
14. *Limestone*, Lower Helderberg, No. VI, from quarry of Buffalo Gap furnace.
15. *Iron Ore*, from banks in No. VII, Oriskany, that supplies Elizabeth furnace at Ferrol station, Chesapeake and Ohio railway.
16. *Limestone*, from No. VI, at Elizabeth furnace.
17. *Marble*, polished slab and blocks, from quarry of Coral Marble Company, in Lower Helderberg, No. VI, on Chesapeake and Ohio railroad, near Craigsville.
18. *Brown Iron Ore*, from old Mossy Creek Mines, in formation No. II.
19. *Marble*, encrinal, from land of Martin K. Garber, Marble Valley, Big Calf Pasture river.
20. *Manganese Ore*, pyrolusite, mammillary forms, from Crimora mines.
21. *Brown Iron Ore*, from Kennedy mine.
22. *Kaolin*, washed China clay, from beds of Virginia China Clay and Fire Brick Company.
23. *Fire Bricks*, of high grades, for all purposes, from above company.
24. *Iron Ore*, from deposit in Valley limestone, No. II.
25. *Stalactites and Stalagmites*, *Calcspar*, encrusted articles, &c., &c., from Weyers' Cave.
26. *Tufaceous or Calcareous Marl*, recent deposit from waters of Lewis creek, near Staunton, with cast of leaves now growing along the creek.
27. *Sand Rock*, from No. IX, Catskill, from summit of Mount Rogers, 4,500 feet above tide, on line of Chesapeake and Ohio railway.
28. *Anthracite Coal*, from Dora coal mine, from formation No. X.
29. *Slate*, "slickensided," or polished by friction of rocks in a great down throw of geological formations; from Dora coal mine.
30. *Two large Stalactites and one Stalagmite*, from the Fountains Cave.
31. *Iron Ore*, limonite, cubical, black, 12" by 16", from Elizabeth furnace ore beds, in Oriskany, No. VII, at Ferrol station, Chesapeake and Ohio railway.
32. *Aryentiferous Galena* (lead and silver), from land of M. K. Garber.
33. *Spiegeleisen*, from Edgar Thompson Steel Works, Pittsburg, Pennsylvania,

made from manganese from Crimora mine on Shenandoah Valley railroad, in this county.

34. *Flaggy Limestone*, from No. III, on Trenton, from Long Glade.
35. *Slate*, from "Redbud" quarry, in Formation No. III, Hudson River.

### BOTETOURT

was formed in 1770 from Augusta. It is forty-four miles long and about eighteen miles wide, and contains 372,627 acres, valued at \$2,308,702. Population, 14,809—white, 10,159; colored, 4,650.

This is one of the finest counties of the James River Valley, and is noted for its fine grass lands and fat cattle. The surface is rolling, and parts of the county are mountainous. The soil is fertile, being formed in large part from the disintegration of limestone rocks.

The productions are tobacco, wheat, corn, oats, cattle and fruits, forming a large aggregate of value. Extensive areas are devoted to fruit growing, and much fruit annually canned and evaporated. There are several large canning establishments in the county. James river flows through the county, and, with its tributaries, gives abundant water-power.

It is traversed by the Richmond and Alleghany railroad following the banks of the James a distance of forty miles, from east to west, and by the Shenandoah Valley railroad from northeast to southwest; and the Norfolk and Western railroad crosses the southeast corner. These roads give convenient access to market from all parts of the county, and have been the means of developing some of the finest iron ore deposits in the State, immense in extent, indeed practically inexhaustible. Five miles below Clifton Forge depot, near the railroad, and in a very accessible situation, is a surface deposit of brown hematite ore, forming a solid mass 300 feet long, 60 feet wide, and 25 feet high. This ore yields by analysis 55 per cent. of superior iron. Limestone in the same region is abundant and of excellent quality. "The Arcadia Iron works employ 125 hands; they use specular ore, yielding 60 to 65 per cent. metallic iron."—*Fincastle Herald*. "The operations of this company have fully proven the existence of four or more continuous beds of specular iron ore (hematite), averaging three feet in thickness, which outcrop in northeast and southwest lines in the western or primordial Blue Ridge for nine miles, from near Buchanan to the northeast, in a three-mile wide belt of mountain chain, parallel with and adjacent to James river. Many thousand tons of this ore, proven by analysis and furnace tests to be of good quality, have been mined from the mountain side, adits and open cuts. Vast quantities of this specular ore can here be cheaply mined, while from the western side of the same belt, almost on the banks of the James in its eastern bends, brown hematite ore (limonite) can be had in abundance from the broad band of that ore that here, as elsewhere, accompanies and caps the Potsdam. I have never before seen such a development of specular ores in Virginia, and am satisfied that the inducements offered by their abundance and consequent cheapness in the immediate vicinity of four or five other varieties of ores, that are also abundant, and at a moderate distance from the best coking coals of the great Ohio basin, must go far towards making Botetourt one of the great iron-producing centres of the country." \* \* \* No region can furnish more cheaply than this any or all the varieties of limestone needed for fluxing in blast furnaces; some of these contain 98.30 per cent. of carbonate of lime, others abound in alumina. Marbles of various kinds abound among these lower silurian rocks."—*The Virginias*.

A fine-grained gray marble, solid and massive, is found near Buchanan in a bed fifty yards wide. The brown hematite (limonite) iron ores have not only a remarkable development in Botetourt county, but they are so disposed in thick, continuous beds, and extended outcrops, that they can be cheaply mined on a large scale. These ores are found in nearly all the mountains of the county. Specular ore has been discovered near Buchanan, one vein fifteen feet thick and analyzing 65 per cent. pure metal. In summing up an account of his exploration of the ores belonging to the Arcadia Iron Mining Company, in this county, Professor J. L. Campbell gives the following as his opinion of the *quality, quantity and accessibility* of these ores: "As to *quality*, the chemical analyses and furnace-tests speak most favorably. As to *quantity*, \* \* ten generations cannot exhaust the supply. As to *accessibility*, the beds are very favorably situated for mining, either by open cuts or tunnels. The numerous ravines that cut across the strata give natural openings at which to begin mining operations, and as these ravines all descend towards the river, all the ore can be transported by a down grade to the point of shipment and use. The Arcadia Iron works were sold January 6, 1880, to a Pennsylvania company for \$125,000. The Salisbury Manufacturing Company has recently put its furnace in operation on the Richmond and Alleghany railroad. The Roaring Run furnace property, about 10,000 acres of iron land, on the Richmond and Alleghany railroad, promises to be one of the leading iron-producing properties in the State. They are raising a large quantity of ore, and expect to erect charcoal furnaces for the manufacture of charcoal iron of high grade."

An esteemed correspondent writes us the following:

"Botetourt, along with her kindred valley counties comprising the lovely Valley of Virginia, may justly boast of as much solid thrift in all manner of industries as any part of our common country; of course many of these industries are in their infancy for want of means and people to bring them to a magnitude commensurate with the natural resources of the county. From an agricultural standpoint, we produce, in great perfection, wheat, corn, oats, rye, tobacco, Irish and sweet potatoes, all of the valuable grasses, peaches, grapes and apples. All small fruits succeed admirably. Within a compass of four miles from where I now write, there are more than (200,000) two hundred thousand bearing peach trees, and immense apple orchards, the fruits of which are either canned or evaporated for market. There are seven steam canning establishments within the small compass above referred to, where fruits and vegetables are packed, furnishing employment for over one thousand hands—men and women—yielding an income yearly to the proprietors of as much as one hundred and thirty thousand dollars.

"Inexhaustible deposits of coal of the best quality, can be furnished on the line of the Shenandoah Valley railroad at a little above three dollars per ton. This road traverses the entire length of the county from south to north on the line of which there is pretty much an unbroken chain of immense iron ore beds, several of which are now being worked on a large scale. On the eastern side of the county the Norfolk and Western railroad also penetrates inexhaustible iron ore beds, as also does the Richmond and Alleghany railroad on the northern side. We are assured that the Valley railroad, partially constructed through our county, will soon be completed to intersect the Norfolk and Western road at some point in the county of Roanoke. For educational advantages, our county is closely dotted all over with public school houses, our towns and a few of the country places supplied with schools of higher grade. Just on the southern border of this county the famous 'Hollins Institute' is located, certainly *one* of the best female schools in the State.

A few hours drive brings us to Roanoke College, at Salem, and at a shorter distance the city of Roanoke.

"There are five mineral water resorts in this county, all of which are (in season) crowded with visitors, hence we have a market pretty much at city prices for everything that can be eaten, from an English pea up to an ox.

"All of the religious denominations are well represented with good church buildings, in towns and country. Stores, mills and workshops in abundance. No malaria, cyclones and earthquakes known, no riots, no mobs, not much whisky and very few people in jail.

"Finally, I can say to immigrants there are lands, large and small tracts, water-power, &c., &c., for sale at fair prices in this county, and a most cordial and home welcome will be given to all who may come amongst us.

"All things considered, *I think it equal to any spot on this earth.*"

Botetourt had on exhibition at the New Orleans Exposition the following samples of minerals :

1. *Manganese*, from H. C. Snyder's land, three miles from Buchanan.
2. *Red-Shale Iron Ore*, from Clinton, No. V, beds in Purgatory mountain, three-quarters of a mile from Buchanan station, Richmond and Alleghany railroad. This specimen is from a pile of 300 tons, now mined and stocked at one point on an extensive outcrop that has been uncovered at six places, and shows a regular thickness of from 18 to 28 feet.
3. *Manganiferous Iron Ore*, from same locality as preceding.
4. *Red Specular Iron Ore*, from Arcadia furnace property, four miles east of Buchanan, from Potsdam No. 1 beds.
5. *Manganese*, from Houston iron mine, near Houston station, S. V. R. R.; used for spiegel at Cambria Works, Johnstown, Pa.
6. *Marble*, from Silurio-Cambrian beds, No. II, from Thomas', on Catawba creek, three miles east from Roanoke Red Sulphur Springs.
7. *Calcite*, from line of S. V. R. R., two miles east from Buchanan.
8. *Pyrite*, from Lunsford's, near Bonsack station, N. & W. R. R.
21. *Cellular Brown Hematite Iron Ore*, from No. III, Hudson river (?) shales, from the thick, regularly stratified beds of Old Catawba Furnace mines.
22. *Massive Brown Hematite Iron Ore*, from same mines as above.
23. *Light Gray Limestone*, No. II, from quarry on S. V. R. R. below Buchanan; used for flux at Crozet furnace.
24. *Blue Limestone*, No. II, from near Blue Ridge Springs, N. & W. R. R.; used for flux at Crozet furnace.
25. *Limonite*, brown iron ore, from Houston mines, near Houston station, S. V. R. R.
26. *Limonite*, brown iron ore, from mines of Crozet Steel and Iron Co., near Blue Ridge Springs, N. & W. R. R.
27. *Marble*, from G. Gray.
28. *Red Iron Ore*, from G. Gray.
29. *Pyrites*, from G. Gray.
30. *Limestone*, from quarry of Indian Rock Lime Works—Edward Dillon, proprietor.
31. *Unslaked Lime*, from above.
32. *Slaked Lime*, from above.
33. *Limonite Iron Ore*, from Purgatory Mountain mine, near Saltpetre Cave station, R. and A. R. R.

34. *Pig Iron*, No. I grade, charcoal, from Salisbury furnace, near Salisbury station, R. and A. R. R.

35. *Limonite Iron Ore*, from Rocky Gully ore bed, Purgatory Mountain.

36. *Limonite*, brown iron ore, from near Eagle Rock station, R. and A. R. R. Analysis by Dr. A. Koenig of run of mine gives 47 per cent. metallic iron, low silica, and only trace of manganese.

37. *Manganiferous Iron Ore*, same locality as above.

38. *Limestone*, containing 97.5 per cent. carbonate lime; abounds at same locality.

39. *Limestone*, samples from Lower Helderberg, No. VI, Prices' Bluff, R. and A. R. R.

40. *Limonite Iron Ore*, from Oriskany, No. VII, mines of Wilton furnace, east slope of Rich-patch mountain.

The following is taken from the list of Roanoke county minerals, as they plainly belong to Botetourt :

16. *Iron Ores, Limestone and Pig Irons*, from Crozet furnace, Roanoke city, from Mr. Samuel Crozet, president, and Col. D. F. Houston, superintendent, viz :

1. *Limestone*, from Buchanan, Botetourt county, on line of S. V. R. R.  
 2. *Limestone*, from near Blue Ridge station, Botetourt county, N. & W. R. R.  
 3. *Limonite Iron Ore*, from Houston mines, near Houston station, S. V. R. R., Botetourt county.

4. *Limonite Ore*, from mines of Crozet Steel and Iron Company, near Blue Ridge station, Botetourt county.

#### CLARKE.

Clarke county was formed from Frederick in 1836. It is seventeen miles long and about ten wide, and contains 109,343 acres, assessed at \$2,842,021. Population—white, 5,145; colored, 2,537; total, 7,682.

This beautiful county is, in proportion to area, almost, if not quite, the richest in the State, and the assessed value of lands is the highest except that of Loudoun. The Shenandoah river flows through the eastern part of the county, at the foot of the Blue Ridge.

The surface of the main part of the county, lying between the Shenandoah and Opequan rivers, is gently undulating—just sufficiently so for drainage. The soil is of unsurpassed fertility, and peculiarly adapted to the growth of wheat and corn, clover and timothy. Blue grass is indigenous, and soon forms, on uncultivated fields, a sod equal to the far-famed fields of Kentucky. The land east of the Shenandoah river is mountainous, and generally covered with valuable timber of pine, oak and chestnut. When cleared the mountain sides produce blue grass, affording fine pasturage for sheep and cattle. Sumac grows in abundance on the mountain fields, and affords a source of considerable income to the inhabitants.

It belongs to the limestone formation; the limestone being readily obtained on almost every farm for building purposes and for burning into lime. Iron ore of rich character is found in great abundance, and is now being mined and shipped to the furnaces of Pennsylvania. Copper and lead are also found. Numerous flour mills are located in the county, manufacturing flour extensively for the Baltimore and other markets.

Wheat, corn and hay are the special productions, with all kinds of fruits of this latitude for home consumption, and apples for export.

Large numbers of cattle, sheep and hogs are grazed and fed, and sold in Baltimore, Philadelphia and New York markets, and many fine horses sold to city buyers.

The climate is healthy; the people intelligent and enterprising; the farms well improved with buildings and fencing of the best character; and the system of cultivation thorough and profitable.

Churches of the various Christian denominations are found in the villages and in the country, and public schools in sufficient number to meet the demands of the people.

Berryville, the county seat, is a flourishing town of 1,500 inhabitants, beautifully situated on the Shenandoah Valley railroad. It contains seven churches, a graded school of high character, one bank, and a number of mercantile establishments. The other villages in the county are Millwood, Boyce and White Post.

The Shenandoah Valley railroad, extending from Hagerstown, Maryland, to Roanoke, Virginia, passes through the county from north to south; the Valley Branch of the Baltimore and Ohio railroad passes through the northwestern part of the county; and the Washington and Ohio railroad, when completed, will pass through from east to west. Five Macadamized turnpikes traverse the county.

Clarke county had the following

#### MINERALS ON EXHIBITION AT THE NEW ORLEANS EXPOSITION.

1. *Limonite Iron Ore*, from the "Berryville" mines, mine No. 1, the "Burchell."
2. *Limonite Iron Ore*, from mine No. 2, the "Morgan."
3. *Limonite Iron Ore*, from mine No. 3, the "Moore."
4. *Limonite Iron Ore*, from mine No. 4, the "Wilson."
5. *Limonite Iron Ore*, from mine No. 5, the "Grifith."
6. *Kaolin*, from Carter Shepherd's farm, west of Shenandoah river at Castleman's ferry.
7. *Iron Ore*, from Dr. Foster Burchell's, three miles south of Berryville.
8. *Iron Ore*, from C. H. Castleman's, west of Shenandoah river, at Castleman's ferry.
9. *Iron Ore*, from J. K. Louthan, two miles west of Berryville.
10. *Iron Ore*, magnetic, from Major T. L. Humphreys.

#### FREDERICK

was formed in 1738 from Orange. It is twenty-five miles long and about eighteen miles wide. It is the northernmost county of Virginia since the partition of the State, and one of the finest of the famed Valley of Virginia, and is noted both for its fine lands and good farming.

The surface is undulating, and the soil very productive. The eastern portion has a belt of gray slate land from two to six miles wide, and running the entire length of the county on the line of Clarke.

This soil produces fine crops of grain and grass.

The timber here is oak, hickory and ash, and pine on the slate lands.

The limestone belt, which is four to eight miles wide, is one of the finest and most productive sections in the State.

West of this valley is the "Little North mountain"; between it and the "Big North mountain" is a valley about six miles wide of limestone land. In this valley are some valuable lands and fine farms.

The timber in the limestone belts consist of finely grown trees of oak, hickory, walnut, ash, locust and elm.

Travertine marl exists in the limestone valleys.

In the North mountain are extensive deposits of iron ore of good quality, which has been successfully worked, with several furnaces. Coal of anthracite character is also found.

West of North mountain the land is generally a gray slate formation, which produces well.

Rock Enon Springs, on the west of North mountain, and Jordan White Sulphur Springs, five miles from Winchester, have an extended reputation for the virtue of their waters, and are liberally patronized. The water of the Jordan Springs is very much like that of Greenbrier White Sulphur, and it is used in the same class of diseases.

The chief productions of this county are wheat, corn, rye, buckwheat, oats and the grasses. Fruits succeed well, the apple particularly.

Winchester is the largest town, and has a population of nearly 6,000. There are several smaller towns, beautifully located on the banks of the streams which flow from the adjacent hills and mountains.

Population, including Winchester, 17,553; white, 14,997; colored, 2,556.

Number of acres of land, 268,950; assessed at \$3,454,408.

In this county are some of the best lands of the Shenandoah Valley. Soil, climate and air combine to make this one of the richest and healthiest regions in the world, and it abounds in clear streams and copious springs. One of these springs, just outside the city limits, gives to Winchester an abundant supply of the purest water.

"Within the county of Frederick, and at an average distance of eight miles from Winchester, are thirty-seven flour mills, the largest of which is the Baker steam mill, which has a capacity of 175 barrels of flour per day. There are seven woolen mills, eight tanneries, one steam paper mill, one bone dust and fertilizer factory, one sumac and bark mill, two iron foundries, a shoe factory, six glove factories—"the largest of which works from 200 to 300 hands"; "ten cigar factories, working 5 to 40 hands each, three box factories, three carriage factories, one wheat-fan factory, several cabinet factories, one agricultural implement factory, several saw and planing mills, and quite a number of minor operations of various kinds." "The county has no public debt, and its parish farm is about self-supporting." "It has two banks—the Shenandoah Valley National, capital \$100,000, surplus \$60,000; and the Union (State), capital \$50,000." There are three excellent female seminaries—Episcopal, Methodist and Presbyterian—and one male academy, located in Winchester, and a flourishing Normal school in Middletown. The new public school building in Winchester is an ornament and credit to the city. The National and Stonewall cemeteries are within the corporate limits of Winchester. Three weekly newspapers and one monthly literary paper are published within the county."

The Valley Branch of the Baltimore and Ohio railroad runs through the county, and is a great through route for travel and traffic from the east and northeast to the south and southwest. The Washington and Ohio railroad, when extended, will cross this county via Winchester from east to west.

#### MONTGOMERY

was formed in 1778 from what was then called Fincastle district. It is about 22 miles on each of its irregular sides, and contains 247,600 acres of land, assessed at \$2,670,000. Population, 16,717; white, 12,489; colored, 4,227.

The surface is rolling in the central and southern portions, and mountainous in the northern and western parts. The soil is a rich limestone, well adapted to grain and tobacco, and all the grasses grown in Virginia; so that for grazing and stock-raising it is unsurpassed.

Montgomery enjoys a delightful and healthy climate, and is a most desirable part of the great Valley of Virginia.

Timber is abundant—oak of different varieties, chestnut, walnut, hickory, elm, poplar, &c.

It is drained by New river and the headwaters of the Roanoke, which are utilized to a considerable extent in manufacturing enterprises of various kinds.

The Norfolk and Western railroad passes through the centre from northeast to southwest; a branch road from the Norfolk and Western runs along the west line a short distance on its route to the Pocahontas coal mines, in Tazewell county.

The minerals found here are iron ores, gold, galena, zinc, copper, manganese, coal, slate, millstone, and limestones. Much of this mineral wealth is now being developed and gives employment to capital and labor. Recent discoveries of gold have created much excitement, and there have been several sales of mining properties at high figures. There are three mineral springs in the county—the “Montgomery White Sulphur,” the “Alleghany Springs,” and the “Yellow Sulphur Springs,” near the Norfolk and Western railroad, all watering places of great repute.

Christiansburg, the county seat, is a thriving town of 1,400 inhabitants. The Virginia Agricultural and Mechanical College is located at Blacksburg, in the midst of a fine farming country, surrounded by varied and beautiful scenery. This institution is doing an admirable work in educating the young men of this and other sections of the State.

#### MONTGOMERY COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Limonite*, from large deposit on the Spindle lands, near Alleghany Springs, near Norfolk and Western railroad, from F. J. Chapman.
2. *Native Gold*, from Stone's, from C. R. Boyd.
3. *Gold Bearing Quartz, Placer Gold and Gold Gravels*, Brush creek, from W. H. Harman.
4. *Galena*, from near Alleghany Springs, from Prof. Fontaine.

The following from Major John T. Cowan, Cowan's Mills P. O.

5. *Millstone Grit*, suitable and used for millstones, from Brushy mountain.
6. *Coal*, semi-anthracite, from McCoy's mine, on northeast bank of New river, Brushy mountain.
7. *Slate*, from Poverty Valley, Tom's creek, eastern slope of Brushy mountain.
8. *Red Shale Iron Ore*, No. V, from Webb mine, in Gap mountain, used in Sinking Creek Iron Works.

From Virginia Department of Agriculture.

9. *Lead and Zinc Ore*, from Geo. W. Anderson. Assays, 32.78 metallic lead, and 24.88 metallic zinc.
10. *Mispickel or Arsenical Pyrites*, from W. J. Guerrant.

#### PAGE

was formed in 1831 from Shenandoah and Rockingham. The whole county is a valley thirty miles in length and about eleven miles wide, with the Shenandoah

river running through its entire length, and contains 179,163 acres, valued at \$1,713,918. Population, 9,970—white, 8,856; colored, 1,114. The surface of the broad and fertile valley is gently undulating, and rises gradually to the summits of two low mountain ranges which form its east and west borders, the Blue Ridge on the east and Massanutten on the west.

The soil is a rich limestone of unsurpassed productiveness, admirably suited to grain and grass.

Page county is traversed in its entire length by the Shenandoah Valley railroad, which runs through the centre and affords transportation convenient to all parts of the county. Since the construction of this road the development of the county has been very rapid.

Valuable timber of many kinds, as oak, pine, locust, chestnut, walnut, ash and poplar is abundant. The minerals are iron ores, in vast quantities, ochre, manganese, copper, limestone, some of it magnesian, and travertine marl.

Near Luray is a beautiful cave with an endless succession of extensive chambers ornamented with numerous stalactites and stalagmites. This is numbered among the noted caverns of the world, and attracts from all parts of the country thousands of visitors curious to examine its wonders, which surpass those of any other known to man. It is now fitted up with electric lights and all conveniences for exhibition.

Luray, the county seat, is a beautiful town, and one of much commercial importance, being the emporium of this rich Page Valley, and on the line of the great Shenandoah Valley railroad.

"It has nearly trebled its population since the opening of the railroad, five years since—nineteen stores, including drug, hardware, confectionery and implement stores, one incorporated female seminary, one public high school, four public schools, and two private and select schools, one Episcopal, two Methodist, three Baptist and one Lutheran church, one bank, two weekly newspapers, etc., and sixty-eight public schools in the county. A building association recently organized promises well, having already a number of buildings to erect.

"There are in the county a number of chalybeate and sulphur springs. The county is free from malaria, and its general healthfulness admitted. Luray is becoming a summer resort for city people. The Luray Inn, and Hotel Laurance afford accommodations not surpassed anywhere in the country. The Inn, built in Queen Ann style, is especially attractive to persons of means (three to four dollars per day), and from June 1st to October 1st is always full. Its enlargement is promised in the near future.

"Farming lands along the streams are held at \$20 to \$100 for entire tracts. The better class of farmers have been very prosperous since the war, until the recent decline in the price of wheat and cattle, as shown by their improved barns and dwellings, some of the latter being handsome structures in modern style.

"The average yield of wheat for the entire county is about fifteen bushels, the better lands producing twenty-five to thirty-six. The average for corn is about thirty-five bushels, the highest yields in good seasons reaching seventy-five.

"Farm hands are paid eight to twelve dollars per month and board. Occasionally day laborers on farms are paid seventy-five cents per day. The supply of labor is ample, white and colored. The hotels, boarding houses, tannery, iron works and mines consume most of the surplus products of the hennery, dairy and garden. The price of fruit, green and dried, not justifying shipment, it is saved by being distilled into brandy."

## PAGE COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

The following specimens were contributed by Mr. E. A. Randle, of Luray:

1. *Brown Hematite Iron Ore*, from "Bonanza" mine, of Harmer, Randle & Co.
2. *Brown Hematite*, from "Audenried" mine, of Va. Ore and Iron Co., of Luray.
3. *Brown Hematite*, from "Shank" mine, of A. E. Randle.
4. *Brown Hematite*; from "Weatherhols" mine, of A. E. Randle.
5. *Brown Hematite*, from "Pipe Ore" mine, of A. E. Randle.
6. *Brown Hematite*, from "Williams" mine, of A. E. Randle.
7. *Brown Hematite*, from "Murray" mine, of A. E. Randle.
8. *Brown Hematite*, from "Piney Mountain" mine, of Harmer, Randle & Co.
9. *Brown Hematite*, from "Printz" mine, of Harmer, Randle & Co.
10. *Brown Hematite*, from "Unlean" mine, of Maris & Randle.
11. *Brown Hematite*, from "Honey Run" mine, of Harmer, Randle & Co.
12. *Brown Hematite*, from "Housen" mine, of Harmer, Randle & Co.
13. *Brown Hematite*, from "Farmazanta" mine, of Harmer, Randle & Co.
14. *Brown Hematite*, from "Dovel" mine, of Harmer, Randle & Co.
15. *Brown Hematite*, from "East Liberty" mine, of Miles & Randle.
16. *Epidote*, occurs in syenite at Milam Gap on west side of Blue Ridge, Prof. Fontaine.
17. *Iron Ore, Limonite*, from "Cornelia" mine, near Rust Siding, S. V. R. R., B. C. Rust, proprietor.
18. *Limonite*, from "Strickler" mine, near above, same owner.

From Collection of N. & W. and S. V. R. R.

*Iron Ore*, from "Beverley" mine, one mile southeast of Ingham station, S. V. R. R.

*Iron Ore*, from "Rust" mine, two miles northwest from Kimball station, S. V. R. R.

19. *Limonite*, from "Beverley" mine.

20. *Ochre*, yellow, crude, from Oxford Ochre Co.

21. *Ochre*, yellow, ground, from mills of Oxford Ochre Co.

## PULASKI

was formed in 1839 from Wythe and Montgomery. It is twenty-five miles long and eighteen miles wide. The surface in some parts broken and in others level. The soil is very good, and adapted to grain and grazing.

Population, 8,752; white, 6,302; colored, 2,450. Number of acres of land, 213,585, assessed at \$1,873,857.

The county is situated in the fertile and beautiful New river valley, and is noted for its rich hay and grass and fine stock.

"Its increased railroad facilities and mineral developments have been greater in the last three years than any county in the State. From the Norfolk and Western railroad, which is the main line running through the county from east to west, two important branches have been thrown out—one starting from New River Bridge and extending a distance of eighty-four miles into Tazewell county, opening up the great Pocahontas or Flat Top coal field; and the other, under construction, leaves the main line at Martin's, now Pulaski City and extends up the

New river and Cripple creek valleys, through Wythe and Grayson counties, into North Carolina, and the wealth of iron, lead, copper, zinc and other ores that will be opened up to market is simply marvelous.

"In addition, within the last year the Belle Hampton Coal and Iron Company have built a narrow-gauge road from near Churchwood, on the New river road, to Tyler's Brush mountain coal mines, a distance of four and a quarter miles, and is mining and shipping a quantity of stove and grate coal that commands the best price of any coal in the State. This company has not been able to supply its demands. They have opened four veins—one 2 feet, one  $2\frac{1}{2}$ , one 5, and one  $3\frac{1}{2}$  feet thick. The smaller vein is the most valuable and the one principally worked. This vein is about 80 per cent. anthracite, and the others are soft and semi-bituminous.

"In 1878 the Altoona narrow-gauge road was built from Martins to their valuable coal fields—a distance of eight miles—and has transported great quantities of coal, which has been used principally in smelting zinc ore at the Bertha Zinc Works, and at the salt furnaces of Col. Geo. W. Palmer at Saltville. Col. Palmer now owns the Altoona railroad, the coal banks and also most of the Bertha Zinc Works. The Altoona Coal Company have two veins—one  $3\frac{1}{2}$  feet thick and the other about 20 feet. These veins are bituminous and answer well for smelting the zinc, and use in the salt furnaces.

"The coal on Brushy mountain, on which are located the Altoona and Belle Hampton (or Tyler's) mines, crops out near the top of the mountain for a distance of about forty miles—through Pulaski county, and east and west into Wythe and Montgomery counties—and lays at a pitch of about thirty-five degrees, and from the fact that the veins are thrown up again some miles south—on the Tract mountain, in Pulaski, and Price's mountain, in Montgomery—it is believed that the substratum of the whole valley between is one solid mass of coal. This valley contains some of the best grazing and grain land in the county. Other openings have been made on the veins of coal mentioned; perhaps the next most important development is by Mr. J. R. Miller, near Martin's station.

"There are valuable veins of limestone and fine building stone. Limestone, sandstone, or granite can be gotten, and a fine vein of millstone rock is found on Brushy mountain, near the coal vein. Rock nearly equal to the French burr is gotten out near the Belle Hampton coal banks. There is also on the same mountain a vein from which valuable grindstones are made, and another that furnishes whetstones only surpassed by the genuine Irish hone.

"Many different kinds of ores are found in large quantities. The Radford furnace has been in operation for many years. The ore is inexhaustible and of the finest quality. A vein of zinc ore fifteen feet thick has been found on the lands of D. S. Forney, and near here are the well-known "Bertha Zinc Mines," from which a supply of ore, yielding 45 per cent., is drawn for the furnace at Martin's, on the Norfolk and Western railroad, that has a capacity of 1,300 tons of spelter a year. In other places iron, lead, copper, manganese, &c., are found.

"One of the finest bodies of mineral lands in the United States is located partly in the extreme southwestern end of the county, beginning near the junction of Big and Little Reed Island creeks with New river, and extending a great distance up the New River valley. "Boon Furnace," in this county, is situated on a bed of this ore, and is regarded as one of the most profitable furnaces in the United States. It continued in operation all through the suspension, although having to haul its product fifteen miles to reach a shipping point.

"Valuable lead and zinc deposits occur in juxtaposition to these iron beds

throughout their extent. Taken altogether, it is unsurpassed by any mineral section in the world.

"Great attention is paid by nearly all the leading agriculturists of the county to raising thoroughbred cattle, as well as thoroughbred horses, sheep and hogs.

"The timber embraces all the varieties found in this section, viz.: oak, pine, hickory, poplar, cedar, cherry, ash, walnut, maple, locust, sycamore, etc.

"There are many streams, affording valuable water-power for mills and manufacturing purposes. At Snowville, a thrifty little village, they have a woolen mill, a foundry, agricultural implement shops, and other machinery, and at New River Bridge a foundry and spoke factory, and other works are in contemplation in different parts of the county. The little station heretofore known as Martin's is now called Pulaski City, and promises to be quite a place when the Cripple Creek road is completed.

"There are two papers published in the county, and as many churches as can be found anywhere to the population. Schools are in a flourishing condition, and to all settlers a cordial welcome is extended by a people rarely equalled for wealth, intelligence and virtuous traits.

"Baltimore butchers concede that the beef from this county is among the best grass beef that comes to that market. The production of corn, wheat, rye, oats, buckwheat, grapes, barley and tobacco is equal to the best counties in the southwest."

#### PULASKI COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Limonite*, from Rich Hill mine of D. S. Forney, Capt. F. J. Chapman.
2. *Zinc Ore*, from Bertha mine, Capt. F. J. Chapman.
3. *Brown Iron Ore*, brilliant, from Rich Hill mine, Capt. C. R. Boyd.
4. *Anthracite Coal*, from Belle Hampton Coal Company's mine in Brushy mountain.

The following from this county are contributed by the N. and W. and S. V. railroads :

*Iron Ore*, from Radford furnace on Mack creek, one and one-eighth miles south of New river.

*Iron Ore*, from "Johnson" bank of "Reed Island" furnace, one and a half miles south of New river.

*Iron Ore*, from "Honaker" bank, one and a half miles southeast of Pulaski station.

*Iron Ore*, from "Walton" mine furnace.

#### ROANOKE

was formed in 1838 from Botetourt. It is twenty miles long and about fifteen miles wide, and contains 193,198 acres, assessed at \$2,515,343. Population—white, 8,273; colored, 4,828; total, 13,101. The surface is undulating, and in parts mountainous, all of its boundaries being crests of mountain ranges, and the streams flowing from it run in various directions, some northeast into the James, while Roanoke river, the chief stream in the county, flows southeast.

Salem, the county seat, is prettily located on Roanoke river and the Norfolk and Western railroad. Roanoke, the southern terminus of the Shenandoah Valley railroad, is one of the most prosperous towns in the Valley, and is an important centre of trade and manufacturing industries, with large iron furnaces

and tobacco factories. Within three or four years it has grown from a small village to a town of six thousand inhabitants.

The minerals of the county are iron ores in great abundance and purity, coal, slate and limestone. There are several mineral springs, the waters of which are highly recommended. At Botetourt Springs is located Hollins Institute, a female school of high grade.

The following is furnished by a correspondent:

"This county embraces, from its southern to northern borders, all the formations, with their peculiar soils, from the granites to subcarboniferous, in great part, however, shale, limestone and alluvial—all of more than average fertility. Outside and nearer the mountains, belts of 'freestone,' rolling but adapted to culture and the production of certain crops. Prices for land range from \$5 to \$50.

#### AGRICULTURAL PRODUCTS.

Wheat is the principal cereal, the yield being on the average, say fifteen bushels. On the best lands it reaches thirty to thirty-five bushels. Corn, tobacco and the grasses do well. We note a slow but steady improvement in the systems of farming and fine results from attention to good handling.

#### MINERAL PRODUCTS AND RESOURCES.

These are iron, magnetic and hematites, in great abundance; also the forms known as *fossil*, *ferro-manganese*, *dyestone*. Zinc has also been found, it is thought, in large measures. In the mineral belts the lands are very low-priced and offer fine fields for investment.

#### TIMBER PRODUCTS.

All the woods peculiar to central Virginia flourish here, and in the valley forests and the heavy growth on the mountains would seem to invite enterprises of all kinds in which good, cheap and abundant timber is used.

#### SMALLER INDUSTRIES.

Among those already inaugurated we note the cultivation of fruits. A large area of the southwestern part of the county is unequalled in the production of apples, especially the "Back Creek Pippin," being finer fruit than the celebrated "Newtown" pippins, and becoming almost as well known. The lands so producing can be bought at low prices, and this industry can be pushed without exhaustion to far greater limits.

#### MANUFACTORIES.

Some more specially informed correspondent at Roanoke could speak of the extent of and business of the large machine shops and of the iron furnace located there. In Salem we have an extensive steam planing establishment, iron foundry and chair manufactory. Near Roanoke, the Moomaws have achieved an almost national reputation for the extent and good quality of their canned goods—peaches, berries and vegetables. Near Salem, H. Garst has also a similar establishment, representing hundreds of thousands of cans.

#### EDUCATIONAL FACILITIES.

In addition to an excellent public school organization, we have Roanoke College, an institution thirty-four years old, of high grade, and well known in all the Southern States especially. Annual attendance between 150 and 200. Also Hollins Institute for young ladies, a well equipped, well known, prosperous and popular school.

## ROADS.

We note increasing attention to laying out and improving county roads. In addition, a Macadamized road runs through the whole length of the county. The Norfolk and Western and the Shenandoah Valley railroads give excellent facilities for trade and communication. In addition, the Baltimore and Ohio has a branch graded to Salem, and will at an early day have it in running order from Lexington, its present terminus, to Salem. A new railroad has also been located from Craig county to Roanoke, which will open up a splendid untouched mineral belt."

The following is clipped from the November number of the *Industrial South*:

## ROANOKE, VIRGINIA.

The following figures, from an article in a Northern paper, by Mr. Hinton A. Helper, shows a remarkable growth in this flourishing young city:

Population in 1880,	-	-	-	-	-	700
Assessed valuation of property,	-	-	-	-	-	\$250,000
Population in 1884,	-	-	-	-	-	5,250
Assessed valuation of property,	-	-	-	-	-	\$2,200,000
Population in 1886,	-	-	-	-	-	7,200
Assessed valuation of property,	-	-	-	-	-	\$3,950,000

From 1884 to 1886 there were built some 460 houses for business and residence purposes. The bonded debt of the city is \$90,000, to show for which are the jail, market house, opera house, poor house, town hall, steam fire department and three school houses.

## ROANOKE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From F. J. Chapman.

1. *Limonite*, cellular, brown iron ore, from Poor mountain mine, No. 3.
2. *Limonite*, massive, brown iron ore, from Poor mountain mine, No. 1.
3. *Limonite*, clay iron ore, from Poor mountain mine, No. 4.
4. *Limonite*, massive, black iron ore, from Starkey mine, No. 1.
5. *Limonite*, cellular, brown iron ore, from Starkey mine, No. 2.
6. *Limonite*, cellular, brown iron ore, from Hudson Shales, No. III, from North mountain.
7. *Hematite*, massive, red iron ore, from Catawba mountain, near Bland's.
8. *Hematite*, massive, red iron ore, from middle ridge of Catawba mountain range, near preceding.
9. *Semi-Anthracite Coal*, from Vespertine, No. X, bed in Catawba mountain, extending over twelve miles.
10. *An Old Miner's Sledge*, found in Starkey mine, No. 4, where it has lain since 1813, when old "Baek Creek" furnace was washed away. Cast directly from the furnace using the Starkey ore.
11. *Marl*, tufaceous, from McCormick's on Catawba creek, six miles southwest from Roanoke Red Sulphur springs.
12. *Limonite*, from Potsdam Shales, No. 1, from Iron Bluff farm, three miles from Rorer Iron company's railroad.
14. *Roofing Slate*, from Catawba valley.
15. *Stalactite, Lime Carbonate*, from caverns near Roanoke Red Sulphur springs. This is from a recently discovered three-story-down cavern in North or Catawba mountain, which has in it rooms over 200 feet long and 100 feet high.

17. *Limestone*, No. II, from Catawba valley.
18. *Limestone*, No. III, from near Salem.
19. *White Sandstone*, Oneida, from Catawba mountain, five miles west from Salem.
20. *Purple Sandstone*, Medina, from Catawba mountain, five miles west from Salem.
21. *Water*, of Roanoke Red Sulphur springs, six bottles with analysis.
22. *Chalybeate Water*, from Roanoke Red Sulphur springs.
23. *A Green Stone*, resembling serpentine, two varieties, from quarry of Dr. R. B. Hudson, four miles south from Roanoke city; used extensively for sills, caps, etc., in building, and for steps and curbs; soft and dresses easy when first quarried, but becomes hard and weathers well.
24. *Brick Clay*, and a raw and burnt brick, from brickyard of J. W. Earmon.

#### ROCKBRIDGE,

named from its most striking feature, the world-renowned "Natural Bridge," was formed from Augusta and Botetourt in 1778. It is thirty-one miles in length and twenty-two wide, and contains 397,622 acres, valued at \$3,284,902. Population, 20,010—white, 14,667; colored, 5,343.

The surface is rolling and in parts mountainous. The crest of the Blue Ridge forms its southeast boundary; North mountain and Mill mountain are on the west border, and Little North mountain penetrates the northern part.

The region lying between these mountain ranges is undulating and hilly, and has excellent soils, formed from limestone, producing fine crops of tobacco, grain and all the cultivated grasses.

The elevated mountain sides are, to a large extent, arable, and are fine grazing lands.

The timber is abundant, and of valuable kinds, as oak, hickory, chestnut, pine, poplar, walnut, etc.

The minerals and mineral waters of Rockbridge are varied and valuable, and consist of iron ore, tin ore,\* arsenopyrite containing gold and silver, manganese, barytes, marble, gypsum and limestone, some of it hydraulic.

The mineral springs of this county—the "Rockbridge Alum," "Jordan Alum," "Cold Sulphur," "Wilson's White Sulphur," and "Rockbridge Baths"—have a wide celebrity, and are much resorted to for health and pleasure.

Lexington, the county seat, a thriving town of nearly 4,000 people, is located on North river, near the centre of the county, and is the seat of the Virginia Military Institute, and Washington and Lee University, two eminent institutions of learning.

The Natural Bridge in this county is reckoned as one of the world's wonders.

North river flows through the centre of the county, and empties into the James near the south border.

\* Recently tin has been found on Irish creek, near Vesuvius station, S. V. R. R., very rich in yield and promising valuable results. It is now in process of development. It assays from 29 to 60 pure tin. Magnesian lime for hydraulic cement is found on the Glendale estate, and has for many years been made into cement at Balcony Falls, just below. It is also found on the North river, just above Balcony Falls, immediately on the S. V. R. R.

Glenwood furnace, near Glenwood station, is out of blast. It is near very fine iron veins. The "Buena Vista" iron mines are near the R. & A. R. R., and are exceptionally rich. No better site for an iron furnace can be found in Virginia than at or near Balcony Falls. The largest iron furnace in the State is "The Victoria" at Goshen, in this county. Its material is furnished from the mines near the Rock Bridge Alum Springs, by means of a branch railway. Its capacity is from 125 to 150 tons a day.

Transportation by rail is furnished by the Chesapeake and Ohio railroad on the north, the Valley Branch of the Baltimore and Ohio from its northeast border to Lexington, where it connects with a branch of the Richmond and Alleghany railroad, the main stem of which runs for some distance through the southern border; and by the Shenandoah Valley railroad passing east through the eastern and southern portion.

Tourists find in this county some of the grandest scenery of the continent. Besides the Natural Bridge, above mentioned, "Balcony Falls," where James river cuts its way through the Blue Ridge, and "Goshen Pass," on North river, have long been celebrated, and now that this region has become accessible, are daily drawing greater crowds.

A correspondent in this county furnishes the following:

"Water-power abounds in all parts of this county, some utilized, but vast power still waiting capital for its further development.

"Our farmers as a class, notwithstanding the low prices of farm productions, are prosperous. Wages from ten to fifteen dollars per month and plenty of laborers to be had.

"Lands vary in price, according to location and other circumstances, from ten to fifty dollars per acre.

"Some Pennsylvanians have purchased lands here, and others are looking with a view of purchasing. We have as good a population as can be found in America; churches and schools in every section. The people are refined and cultivated.

"There are some mechanical enterprises also located here, which, although in their infancy, promise to be important factors in building up and adding to the wealth of the place.

"Upon the whole, after having visited the greater portion of the United States, north and south, I consider this the most desirable section of this country, possessing more of the material elements of health, wealth, and prosperity than any other country known to the writer."

#### ROCKBRIDGE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Cement*, from James River Cement Works, Balcony Falls station, Richmond and Alleghany railroad.

2. *Potsdam Sandstone*, scolithus bed, formation No. 1, mouth of North river of James.

3. *Limestone*, from bluff below Natural Bridge station, Richmond and Alleghany railroad.

4-5. *Iron Ores*, from No. 7, and *Red Shale*, from No. 5, from Guy Run iron lands of E. A. Parker.

6. *Tufaceous Marl*, deposit from Marl river, at Lyle's plow factory, near Midway.

7. *Limonite*, brown iron ore from upper shales of Potsdam No. 1, at Fulton ore bank.

8. *Limonite*, brown iron ore, massive block, Donald bed in Dogwood hollow.

The following sixteen specimens are from the cabinet of Dr. E. A. Gibbs, Lexington :

9. *Variegated Pink Marble*.

10. *Limestone*.

11. *Coraline Limestone*.

12. *Gray Limestone*, contains 97 per cent. of lime carbonate.

13. *Light Gray Limestone*, contains 96 to 98 per cent. of lime carbonate.
14. *Blue Limestone*, marble, from near Natural Bridge.
15. *Black Marble*, from near Lexington.
16. *Black Marble*, from near Goshen.
17. *Yellow Variegated Marble*.
18. *Brown Marble*.
19. *Stalactitic Marble*, found in large masses.
20. *Yellow Stalactitic Variegated Marble*, near Rockbridge Baths.
21. *Variegated Marble*, from Thompkin's.
22. *Black Marble*, from Steel's,
23. *Red Shale Iron Ore*, from lands of Echols, Bell & Catlett, Staunton.
24. *Limonite*, from "Fridley" mine, of the above firm.

The following are from collection of Prof. J. L. Campbell, Lexington:

25. *Limonite Iron Ore*, fibrous, from Graham's bed on Irish creek.
26. *Limonite*, massive, from same locality as above.
27. *Limonite*, massive, from "Echols" mine, near Balcony Falls.
28. *Limonite*, fibrous, from same locality.
29. *Limonite*, massive, from Victoria furnace mines, near Rockbridge Alum Springs.
30. *Limonite*, from same locality as above.
31. *Limonite*, fibrous and radiated, from Glenwood mines, Western Blue Ridge.
32. *Baryta*, from near Lexington.
33. *Dufrenite*, hydrated phosphate of iron, fibrous, divergent; from Blue Ridge (South mountain), Irish creek region, 12 miles east from Lexington. This is the only locality of this mineral, so far as known, in any of the Southern States.
34. *Dufrenite*, nodular, radiated; from same locality as above.
35. *Dufrenite*, incrustation with concentric layers; from same place as above.
36. *Cassiterite*, tin ore, massive; from Irish creek region of Blue Ridge.
37. *Tin Ore*, cross section of crystalline vein; from same place as above.
38. *Tin Ore*, group of crystals in gangue of quartz and yellow mica; from same as above.
39. *Gray Coraline Marble*, from near Lexington; dressed and polished by Mr. John Hileman.
40. *Ochre*, from outcrop of cement limestone on James river.
41. *Magnetic Iron Ore*, occurs in large amounts at Robert Grant's, on Irish creek.
42. *Hornblendic Granite*, occurs on Tye River Gay road, on west side of Blue Ridge.
43. *Brown Hematite Iron Ore*, from "Carson ore beds" of J. E. A. Gibbs, of Raphine.
44. *Glass Sand*, from Potsdam, near Balcony Falls, from Virginia Department of Agriculture.
45. *Manganese*, from Gay Run iron lands of E. A. Packer, of New York city.
46. *Paints*, a number of colors, from oehres, &c., mica, and made by H. Lerna, of Goshen.
47. *Cassiterite*, from "Mt. Maria" mine, on Irish creek, belonging to Robertson & Grant. Major A. D. Robertson writes us that this ore is from a nearly vertical vein, about 2<sup>1</sup>/<sub>2</sub> thick, opened at 3 or 4 points, and drifted in by tunnel 80' long. It yields 3<sup>1</sup>/<sub>2</sub> per cent. of metallic tin. Seventeen other veins have been

opened, and the existence of others is known. This tin ore has been found over an area of seven miles in length by one mile wide.

48. *Tin Ore*, cassiterite, 200 pounds, from mine of Mrs. Martha D. Cash, Irish creek post-office. This is from the same veins and region as the "Mt. Maria" ore above described.

The following from exhibit of N. and W. and S. V. railroads:

*Iron Ore*, from "Cash" mines, on Irish creek, 8 miles southeast from Vesuvius station, S. V. R. R.

*Tin Ore*, from "Buena Vista" mines, on S. V. R. R., Capt. C. F. Jordan, manager.

### ROCKINGHAM

was formed from Augusta in 1778, and has an area rather greater than that of the parent county. It contains 1,079 square miles, or 696,059 acres, so that it is the largest county in the State, and is second among the Valley counties in population, having 29,567 inhabitants; white, 26,133; colored, 3,434. Although there is much waste mountain land in Rockingham, the average assessed value of the whole is over \$10 per acre, or a total of \$7,824,593.

Every part of this county is watered by the Shenandoah and its numerous tributaries, and there is a large extent of rich meadow land.

Rockingham is one of the largest grain producing counties in the State, and exports large quantities of flour, which has a high reputation in the Eastern markets. All the cereals thrive here, not only those cultivated generally, but buckwheat and barley. And this is peculiarly a grass and cattle region, and a county of fine horses. Great numbers of choice cattle and horses are shipped from Rockingham to the Northern States.

The mineral wealth of this county is considerable—iron, copper, lead and coal. Limestone is everywhere. Several varieties of marble are found here.

There are mineral waters of great virtue in Rockingham, the most resorted to being the celebrated "Rawley Springs," eleven miles from Harrisonburg.

Two great lines of railroad pass through this county—the Valley Branch of the Baltimore and Ohio and the "Shenandoah Valley" road. These give excellent facilities for marketing the rich products—agricultural and mineral—of the county, and will rapidly attract immigration to this beautiful Valley.

There is also a narrow gauge railroad from Harrisonburg to Elkton, connecting the two main lines, and facilitating communication between the different parts of the county.

Harrisonburg, the county seat, on the Valley branch of the Baltimore and Ohio, is a growing town of near four thousand inhabitants—the centre of trade of this rich county.

A correspondent from Rockingham writes as follows:

"Whilst our county has made rapid progress in improving and bettering the farm and its stock, there has been no *new* developments of such importance as to be worthy of special notice in your forthcoming Hand-Book. No new minerals have been discovered or mines opened. The Bridgewater woolen factory has recently doubled its former capacity, and is now running day and night with about 50 hands, filling orders for their goods—especially blankets—from Chicago, St. Louis and Cincinnati, as well as from the northeastern cities. They are unable to supply half the demand for their goods.

"The present year has brought us the most bountiful harvest ever known. The

wheat crop is estimated by competent judges at 1,000,000 bushels. An immense corn crop is now assured, and general prosperity seems to have come over our county. The land is teeming with abundance.

"Great interest is taken in our public schools as well as in the higher education, and I believe that Rockingham stands at the very head, both as to the number and character of her schools.

"Our principal county town, Harrisonburg, is improving rapidly, keeping pace with the general prosperity of the county. The new United States courthouse is nearly completed and is an ornament to the town.

"Several of our prominent farmers are developing quite an interest among our people in improved stock, especially of horses and cattle. Improved stocks of cows and horned cattle are general among our largest stock-raisers. Ours is almost exclusively an agricultural and stock producing county, and is fully abreast of the times in improving these two important sources of wealth.

"Farms are made smaller and better cultivated; dwellings, barns, &c., are being built or improved and beautified all over the county. Notwithstanding last year's crop failure, we are moving forward under the inspiration of the abundance of the present year's crops."

#### ROCKINGHAM COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Professor Fontaine.

1. *Diorite*, occurs in an eruptive dyke 200 feet wide near top of Blue Ridge.
2. *Epidotic Jasper*, from ledge eight feet wide, in Chlorite-Schist, at Swift Run Gap.
3. *Syenite*, occurs in immense quantities in the Blue Ridge on Swift Run Gap road.

The following from the U. S. Assistant Commissioner, Major Jed. Hotchkiss :

4. *Case of Chalybeate Water*, from Rawley Springs.
5. *Galena* (lead sulphuret), from Daniel Showalter's farm, near Chrisman post-office.

The following were contributed by Mr. C. D. Harnsberger, from western base of the Blue Ridge :

6. Two samples *Iron Ore, Limonite*, from the Potsdam, No. 1, from the Miller bank of the Mt. Vernon Iron property, near Weyer's Cave station, S. V. R. R.
7. *Limonite Iron Ore*, from "Raines'" ore bank of Abbott Iron Company, three miles northeast from Port Republic station, S. V. R. R.
8. *Iron Ore, Limonite*, from "Weaver" bank, near 120 mile-post of S. V. R. R., Abbott Iron Company.
9. *Iron Ore, Limonite*, from "Sipe" bank of Abbott Iron Company, near same point.
10. *Ochre, Hamilton's Paint*, from near Keezletown, from Virginia Department of Agriculture.
11. *Kaolin*, from Mrs. J. J. Wood's, from Virginia Department of Agriculture.
12. *Trap Rock*, locally called "Ironstone," from a dyke 40 to 50 feet wide, near the Augusta line, two miles southwest from Port Republic, near Leroy village.

This particular block of trap, two and a half feet long, two feet wide, and two feet high, is an historic one, as it is the block that was used as an "anvil block,"

for a tilt-hammer in the blacksmith shop of Selah Holbrook, at Pork Republic, and on the anvil that was morticed into this block Selah Holbrook and his son, J. H. Holbrook, in 1843, made the sickles for Cyrus McCormick, that were used in the first McCormick reaper or harvester. Loaned by C. D. Harnsberger, the owner of it, Port Republic, Va.

### SHENANDOAH.

was formed in 1772 from Frederick. It contains 332,882 acres, valued at \$3,843,749. Population, 18,204; white, 17,198; colored, 1,006. The surface is rolling, with mountains and many valleys of great beauty and fertility—a very large proportion of the county being of the best class of valley land—disintegrated limestone—a strong and durable soil, admirably adapted to all the cereals and grasses of the climate. In Shenandoah are some of the finest farms in the State, and live farmers who know the value of improved stock, and vie with each other and with those of the adjoining counties for the production of the best. Farms sell for \$30 to \$100 per acre. The uplands are fine for grazing, being natural blue-grass land. Labor is plenty. Wages fifty to seventy-five cents per day.

The north fork of Shenandoah river traverses the entire length of this county, abundantly watering it, and giving power for manufacturing purposes. The valley of this river cannot be excelled for the beauty and fertility of its lands. The Valley Branch of the Baltimore and Ohio railroad runs the entire length of this county from northeast to southwest, its line being of convenient access from all parts of the county.

The minerals found here are iron ore, coal, manganese, galena, antimony, marble and limestone. Very little developed as yet. The "Columbia" and "Liberty" furnaces in this county make A No. 1 pig iron. At Edinburg a large agricultural implement factory has been organized.

Much of the wheat raised here is exported in the shape of flour, which has a high reputation.

Among the attractions of this county should be mentioned the "Orkney Springs," a place of great resort for health and pleasure seekers from other States and all parts of Virginia. The Shenandoah Alum and Burners' White Sulphur Springs are also in this county, besides many fine mineral springs on the farms.

#### SHENANDOAH COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Limonite and other Iron Ores*, mainly from No. V, Limestone No. VI, Lower Helderberg; charcoal pig iron, &c., from mines of Columbia and Liberty furnaces of Columbia-Liberty Iron Company, in North mountain, on Stony creek, west side of "The Valley," W. D. Pollard contributor.

2. *Limonite and other Iron Ores*, mainly from No. V, Limestones No. V, charcoal pig iron of various grades; sandstones, from Dr. Frank King, Van Buren furnace, Cedar Creek Valley.

3. *Iron Ores, Limestones, &c.*, from Henrietta furnace, head of Stony creek, west of Little North mountain, Mrs. A. J. Myers.

The following were collected for the Virginia Midland railway by M. W. G. Douglas:

1. *Manganese*, from Powell's Fort M. Co., near Water Lick station.
2. *Iron Ore*, from same company and locality as above.
3. *Calcareous Tufa, or Travertine Marl*, one mile from Strasburg.

The following are from the furnace property of Mrs. A. J. Myers, Shenandoah Alum Springs post-office:

3. *Iron Ore*, from Powder Spring bank.
4. *Iron Ore*, from Open bank on Iron Hill.
5. *Iron Ore*, from extensive outcrop near furnace stack.
6. *Limestone*, from near furnace.
7. *Fire Clay and Brick*, from same.
8. *Shales and other Rocks*, from vicinity of furnace.
9. *Shenandoah Alum Water*, claimed to be best of its class.
10. *Sulphur Iron Water*.
13. *Chalybeate Water*.
15. *Lithia-Sulphur Water*.
15. *Alum Shale*, from which the above alum water flows. All these waters are from a circle of three hundred yards, and Mrs. Myers claims it as the greatest variety of mineral waters of medicinal value from one locality.
10. *Iron Ore*, from David Neff, from Virginia Department of Agriculture.
11. *Calc-Spar*, from George J. Grandstaff, of Edinburg, from Virginia Department of Agriculture.

#### SMYTH

was formed in 1831 from Washington and Wythe. It is in the form of a parallelogram with two of its sides about thirty miles in length, and contains 305,922 acres of land, assessed for taxes at \$1,662,424. Population, 12,160—white, 10,520; colored, 1,640.

It has on the north Clinch mountain, Poor Valley mountain, Walker's mountain and Brush mountain, while Iron mountain forms its southeastern boundary. These ranges have courses parallel with each other northeast to southwest, and are separated by valleys of fine farming and grazing lands.

The productions are tobacco, corn, wheat, oats, rye, buckwheat, grass and fat cattle. Tobacco culture in this and the adjoining counties has been rapidly developed in the last few years. Bright tobacco of the finest quality is now grown in this region, and the planter has learned to handle it so as to get the top market prices. The mountain lands produce spontaneously the finest blue grass, and so it follows that this is an admirable stock country.

Timber is abundant and of the valuable kinds common to this section of the State.

The climate is a delightful one in the summer, and is very healthy.

There is no town of importance except Marion, the county seat, which is a beautiful and busy town on the line of the Norfolk and Western railroad. The Norfolk and Western railroad crosses this county about the centre, and has Marion, the county seat, as one of its stations.

Smyth is drained by the three forks of the Holston river, giving it abundant water power for all kinds of manufacturing purposes.

The minerals of this county include iron ore, lead ore, copper ore, gypsum, salt and marble. These minerals are in great abundance and some of them are being extensively developed.

#### SMYTH COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Red Iron Ore*, from six-foot bed many miles long, head of Coma creek, on Smyth and Grayson line; from Capt. C. R. Boyd.
2. *Marble*, from Hezekiah Harman's land; from Capt. C. R. Boyd.

The following were collected by Mr. James H. Gilmore, of Marion :

3. *Iron Ore*, from the lands of Thomas E. Gardiner.
4. *Iron Ore*, from the lands of M. B. Tate.
5. *Iron Ore*, from the lands of John M. Preston.
6. *Barytes*, two samples, from the land of G. C. Goodell.
7. *Soapstone*, from the land of A. G. Pendleton.
8. *Gypsum*, plaster, from the land of J. H. Buchanan.
9. *Brown Hematite Iron Ore*, occurs in large amounts west of Marion ; from Prof. Fontaine.

### WARREN

was formed in 1837 from Frederick and Shenandoah. It is twenty miles long and twelve miles in width, and contains 121,787 acres of land, valued of \$1,386,227. Population, 7,399—white, 5,958 ; colored, 1,441.

It lies on the western slope of the Blue Ridge, and has Three-Top mountain on its western border. The south fork of Shenandoah river passes through its centre.

The surface varies from intervals and gently sloping hills to steep mountain declivities.

The soil is in general excellent—formed from disintegrated limestone, and (in places) from epidotes and hornblende, and produces excellent crops of corn, oats, rye, wheat, buckwheat and grass, and much care and attention is devoted to fruit-raising. Grape culture especially has been extensively and successfully carried on for many years, the epidote lands in the vicinity of the beautiful village, "Front Royal," being admirably adapted to the growth of the choicest varieties of the vine. One of the oldest and largest vineyards in the south is located here.

Stock-raising forms one of the most important industries. Large numbers of fat cattle are annually sent to market.

The transportation facilities are excellent, and are furnished by the Shenandoah Valley railroad passing from north to south through the centre, and the Manassas Branch of the Virginia Midland railroad, crossing it from east to west, also the Valley Branch of the Baltimore and Ohio running near the west line for ten miles.

This is a most highly favored and desirable region, enjoying a delightful climate and having all the accessories for prosperity and pleasant living. There are numerous mineral springs ; the streams teem with good fish, and much game is still found.

Front Royal is a prosperous town of 1,600 inhabitants, three large hotels, with twenty-odd stores, two banks, and several factories. Lands are worth from five to ten dollars per acre—good turnpikes and county roads, fine schools, and all needed is plenty of capital to develop the mines and improve the waste places.

The minerals are iron ore, copper, ochre, umber and limestone, of which the following specimens were on exhibition at the New Orleans Exposition :

*Umber and Ochre*, from Salina and other banks near Overall station.

*Iron Ore*, from "Happy Creek Mining Company," one mile from Happy Creek station.

*Limonite Iron Ore*, from "Iron Mountain Mine," of Mavis & Reynolds.

*Limestone*, from quarry of Carson & Sons, burned extensively.

## WASHINGTON.

Population, 25,203—white, 21,113; colored, 4,090. Contains 382,232 acres, assessed at \$3,235,676.

This is one of the finest counties of the southwestern part of the State. It lies on the Tennessee border, and is bounded on the northwest by Clinch mountain, and on the southeast by the Blue Ridge. It is watered by the three forks of the Holston river, which pass through its length, and, with their tributaries, furnish abundant power for mills and factories.

The surface is rolling in its central parts and quite rugged on its mountain borders. The soil is a rich limestone, producing fine crops of tobacco, the cereals and grasses.\* Cattle, horses and sheep are reared and fattened in great numbers.

This county is rich in minerals. On the west slope of the Blue Ridge are large deposits of a semi-magnetic iron ore, free from phosphorus and containing 69.74 of metallic iron. On Clinch mountain are found continuous beds of fossil ore. Lead and zinc ores, salt and plaster are also found in this county. "The Holston Salt and Plaster Company," at Saltville, are now producing annually 800,000 bushels of salt, and this company, together with the "Beuna Vista Plaster Company," produce 6,000 tons of plaster yearly. The salt wells at this place have the strongest brine known, and that, as well as the gypsum veins, are inexhaustible, and extend many miles into the adjacent county of Smyth.

The climate of this region cannot be excelled for health and pleasantness, as is evidenced by the large stature and robust appearance of the people.

Abingdon, the chief town, has a population of over 2,500, and is a centre of refinement and culture. It has two female colleges and a fine courthouse, in which is held not only the county and circuit courts of the State, but the circuit court of the Federal Government for the Western District of Virginia.

Bristol, just on the county line, contains about 4,000 inhabitants, and is the western terminus of the Norfolk and Western railroad, which traverses the county centrally. There is a branch of this road from Glade Spring to Saltville, near the Smyth county line.

The following is from a valued correspondent :

"The soil is adapted to almost all kinds of grain, and is susceptible of indefinite improvement; although it now yields from 25 to 75 bushels of corn to the acre, and wheat 15 to 35, yet, by proper culture this might be very nearly doubled, and the grasses of all kinds are produced in the greatest abundance at the rate of from one to three tons to the acre, that is, of such as timothy, clover and orchard grass. Other grasses are more adapted to pasturing and are never so heavy, but are such as fatten stock rapidly and grow in great luxuriance. No county produces finer timothy and clover.

"On the northeast border there are beds of salt and plaster which will probably not be exhausted for ages to come. Mineral springs and mineral water of all kinds are abundant all over the county—sulphur, alum, chalybeate, &c.

"There is water-power enough in the county of Washington to exclude all steam-power or the necessity of it, except for transportation, for all kinds,

\* A correspondent, in reply to an interrogatory, says Washington county produced about 2,000,-000 pounds tobacco in 1884. The great bulk of the crop in this section is bright; generally of good body and excellent texture. Being grown on new lands, it is remarkably free from dirt and is very sweet. The bright crops of 1884 have averaged so far, at public sale in warehouses in Abingdon, from \$10 to \$25. The bright crop of 1883, averaged from \$10 to \$45. Our best tobacco is raised on freestone lands; yet we have some very fine crops from limestone.

from the turning of a grindstone up to the running of cotton factories with their thousands of spindles ; and we have some of the best mill sites to be found, where nature has done everything but build the mills, and what a pity we have not the enterprise to have better mills. We want men and mechanics and a well organized system of labor—with such, no county could surpass our Washington. ‘The harvest is great and the (right kind of) laborers are scarce.’ Common labor commands from 50 cents to \$1 per day, skilled labor, mechanics, from \$2 to \$4.

“The roads and road system is fast improving; railroads, in addition to those now in operation, are in process of building, and the county will soon be checked with good roads of all kinds.

“The school system is well established, and facilities for a common education or a collegiate course are here found convenient, accessible and cheap for all, and none may remain ignorant and uneducated.

“No county under the sun is more healthy; this is really the place of refuge for the Southern invalid or the city dyspeptic and may really be called the garden spot of Virginia.”

#### WASHINGTON COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Capt. C. R. Boyd.

1. *Iron Ore*, semi-magnetic, from Gallaher mine.
2. *Mineral Water*, and “iron and alum mass,” from Seven Springs.

From Gen. J. D. Imboden.

3. *Limestone*, highly fossiliferous, 8" cube, from north fork of Holston, at Mendota.
4. *Grindstone*, 15" by 4 $\frac{1}{2}$ ", from a surface sample, from mouth of Whetstone branch of Wolf creek.
5. *Red Calcareous Rock*, very hard, fine building stone, from stratum over 30' thick, near Mendota.
6. *Limestone*, Valley or No. II, from one mile west from Goodson.
7. *Barytes*, from Virginia Department of Agriculture.

The following are contributed by W. K. Armistead, of Abingdon :

8. *Plaster*, sulphate of lime, one box from near Saltville.
9. *Iron Ore*, semi-magnetic, from Gallaher mine, near N. & W. R. R., five miles northeast from Abingdon.
10. *Iron Ore*, red, from Rickets' mine.
11. *Iron Ore*, red, from Gallaher mine.
12. *Iron Ore*, red, from Gray mine, South Fork of Holston river.
13. *Iron Ore*, fossil, dyestone, from Big Moccason Gap of Clinch mountain.
14. *Brown Iron Ore*, Oriskany, from Clinch mountain.
15. *Brown Iron Ore*, from Potsdam shales.
16. *Brown Iron Ore*, from Silurian shales of Iron mountain.
17. *Manganese*, black oxide, from Potsdam shales of Iron mountain.

#### WYTHE

was formed in 1790 from Montgomery. Contains 327,675 acres, valued at \$3,053,508. Population, 14,314; white, 11,464; colored, 2,850.

This county is an elevated mountain region, with three fertile valleys between the mountain ranges, which traverse it mainly from northeast to southwest. The

soil in these valleys is very productive, and gives abundant returns in large crops of grain, hay, and fine pasturage for cattle.

The mountains are rugged and broken, but they are filled with abundant stores of mineral wealth; and are clothed with finely grown trees of various kinds—oak, hickory, chestnut, ash, pine, lind, maple and walnut.

Wythe is drained by New river and many of its tributaries which arise among lofty mountains, and, being fed by bold and constant springs, have abundant fall and volume during the driest seasons, affording vast amounts of water-power for mills and factories.

The Norfolk and Western railroad runs through the centre of this county, and has a branch road leading from Martin's station in Pulaski, into the great mining region in the southeast part of Wythe.

The minerals found in this county are immense in amount and value, and comprise iron ores, zinc ores, lead ores, manganese, barytes, asbestos, coal, marble, soapstone, gypsum and kaolin. These minerals have been developed and proven to exist in immense deposits, and are now being largely worked. There are in operation many blast furnaces, forges, smelting works and rolling mills.

Wytheville, the chief town and county-seat of Wythe, is a beautiful and flourishing place, possessing many attractions and solid advantages. Its healthful and bracing climate has caused it to become a great place of summer resort for southerners and lowlanders—and it is the central town of a great mineral region, and a fine pastoral and farming country as well. Population, 3,000.

A correspondent writes :

"In addition to what is said in the Hand-Book of Virginia please permit me to add the price of farm lands—from \$15 to \$100 per acre, and should average about \$30 per acre for farm lands.

"The average is 400 acres to the farm, and there is not an acre in good tilth in the county but will set itself into Kentucky blue grass and white clover. All cultivated clovers and grasses do well here, and the highest hills will produce as good hay, and when in tilth nearly as much as creek and river bottoms—one and a half to three tons per acre. Grain—corn on sod, 30 to 80 bushels per acre, average 40 bushels; wheat on same, 18 to 22 bushels; on stubble, 10 to 12; rye, a little better yield; oats, not so sure as on freestone of the same tilth. Garden vegetables of all kinds in abundance. All lands in the county in good tilth will produce a large heavy tobacco crop, but it grows too heavy; this is why not more is raised in this county. Fruits of all kinds in abundance—cultivated and wild.

"Thirteen charcoal iron furnaces in this county, all working on the New river and Cripple creek brown hematite ores, making No. 1 car-wheel iron, boiler-plates, bar iron and steel. The ores run 53 to 57 per cent. iron. We also claim that with coke we can produce this same iron at \$11 per ton, and this statement has not been denied by iron men, when on the grounds to see for themselves. The Norfolk and Western railroad extension, when finished, up New river and Cripple creek will bring the Pocahontas coal direct to each furnace on the line through this county, and over a standard gauge, first-class railroad, well ballasted and equipped. Limestone of the best quality for flux at all the furnaces.

"We invite all, and especially our New England friends, to bring their families and come down and pay us a visit and see for themselves. We invite you as one family to come and settle and make your permanent homes with us. We also extend the same invitation to people in other lands who will be pleased to bring their capital and settle with us. I have many personal friends in New and Old England that are in the iron, zinc and lead business, and I refer you to the great and well

known iron and steel man, Jacob Reese, Esq., of Pittsburg, Pa., as to the grade and value of our Cripple creek iron ores."

WYTHE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From F. J. Chapman.

1. *Limonite, Brown Iron Ore*, from Walton furnace.
- 2 *Limonite*, from Van Liew furnace mine.
3. *Limonite*, from Graham Furnace mine.
4. *Limonite*, from Frank Smith mine, near Boom furnace.
5. *Limonite*, from Boom furnace mine.
6. *Limonite*, from Pierce furnace mine.

The following from Capt. C. R. Boyd:

7. *A Series of Lead*, zinc, iron and barytes ores, illustrating Boyd's sections at Wythe Lead and Zinc mines, and at Ivanhoe furnace of Hendricks Bros.
8. *Zinc Ores*, from Falling Cliff mine, of D. S. Forney & Co.
9. *Brown Iron Ores and Turgite*, from Irondale, Slaughter, Dunn & Co., Ravenscliff and Speedwell deposits, Cripple creek basin, from beds 20' to 120' thick.
10. *Pig Metal*, from Ivanhoe Furnace of Hendricks Bros. Stands breaking strain of 41,000 pounds.
11. *Copper Pyrites*, from southern spurs of Lick mountain, containing 30 per cent. copper.
12. *Potsdam Sandstone*, from Scolithus bed, Lick mountain, near Wytheville.
13. *Brown Oxide of Iron and Manganese Oxide*, from 20' bed of W. A. Stuart's 15,000 acre tract, Lick mountain.
14. *Red Iron Ore*, semi-magnetic from 9' bed of Frank Blair, near Wytheville.
15. *Brown Iron Ore*, from Robert Crockett's lands, southern spur of Little Walker mountain, in No. X. Ore contains 50 per cent. metallic iron, and 0.80 of phosphorus.
16. *Kidney, or Hollow Iron Ore*, black band, from outcrop 18" thick, in No. X, from Stony Fork.
17. *Bituminous Coal of No. X*, from Stony Fork.
18. *Coke*, made from the above coal.
19. *Red and Brown Iron Ores*, from black slates of No. VIII, from southern foot of Big Walker mountain.
20. *Clay Iron Ore*, from base of black slates of No. VIII.
21. *Flint*, from upper Helderberg, showing zinc blende, from south foot of Big Walker mountain.
22. *Brown Oxide of Iron*, from 18' of No. VIII, Oriskany, south slope of Big Walker mountain.
23. *Brown Iron Ore*, from No. VII, Oriskany, from lands of Boyd, Stearns & Co., Walker mountain.
24. *Brown Shale Iron Ores*, of No. V, from same locality as above.
25. *Red Shale Iron Ores*, of No. V, from same locality as above.
26. *Fossils, Spirifers, &c.*, from No. IX, from Crockett Cove, Little Walker mountain.
27. *Fossil Coal Plants*, from proto-carboniferous rocks, No. X, Stony Fork.
28. *Variegated Marble*, from lands of Umbarger and others, near Wytheville.
29. *Limestone*.

30. *Limestone*, No. II.
31. *Calcium Fluoride*, fluor spar, from Red creek, three miles west from Wytheville.
32. *Mineral Water*, from Wytheville.
33. *Grindstone Rock*, from base of No. X, Stony Fork of Reed creek.
34. *Whetstone Rock*, from No. IX, Old Red Sandstone Series, from Stony Fork.
35. *Fine Hone Grit*, from lands of Boyd, Stearns and others, south slope of Big Walker mountain; said to be equal in quality to the Scotch.
36. *Manganese Oxide*, from Crawford's.
37. *Sandstone*, with scolithus linearis, from Lick mountain range, largely used for backing and hearthstone in blast furnaces.
38. *Sandstone*, for glass making, from Lick mountain lands of Stuart and others.
39. *Lead Sulphuret*, from lands of Mr. Price, near Ivanhoe furnace, New river region.
40. *Iron Ore*, from lands of Lobdel Car Wheel Company; from northern outcrop of Cripple creek.
41. *Iron Ore*, brown, from Simmerman's, Cripple creek region.

The following are from Old Poplar Camp furnace, in the gap of Poplar Camp mountain, contributed by A. N. Chaffee, owner of the furnace property :

42. *Iron Ore*, from Potsdam shales.
43. *Sandstone*, Potsdam.
44. *Limestone*, formerly used in Poplar Camp furnace.

From Virginia Department of Agriculture.

45. *Oilstone*, from Little Walker mountain.
46. *Ochrous Silicate*, from Sayers, New river, mouth of Reed creek.
47. *Manganese*, from Gay Run Iron lands of E. A. Packer, of New York.

## BLUE RIDGE DIVISION OR NEW RIVER PLATEAU.

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This elevated plateau, situated between the two widely diverging limbs of the bifurcation of the Blue Ridge, presents many features of high interest alike to the geologist and the practical miner. All of its ledges and bands of rock strata, its numerous deposits of ores and minerals, and its system of drainage, seem to have been projected on a scale of superior proportions. Its elevation above tide, of about 2,600 feet average, secures for it perfect immunity from malarial diseases, and its high mountains, wooded to the summit, bring the rains in due season; so that, with greater facilities of transportation once secured to it, they will become a most formidable competitor with all other divisions as a factor in solving the question of the State's prosperity.

As heretofore stated, the plateau of the Blue Ridge is composed of the three counties—Floyd, Carroll and Grayson. They are separated from the Valley Division by the westerly bifurcation of the Blue Ridge, under the names of Pilot mountain, Poplar Camp and Iron mountains, and from Piedmont by the eastern limb of that bifurcation.

In the absence of lines of railway transportation, by which the superior beds and deposits of valuable ore would be developed, these counties now send to market from their naturally fine soil, herds of fine, healthy cattle, flocks of sheep, much high-priced tobacco, wheat, dried fruit, herbs, etc., and some of the finest apples produced in Virginia. This freestone soil—that is, the soil resulting from a decomposition *in situ* of extensive bands of granitoid rocks, gneiss, hornblende, aluminous slates, shales, feldspars, etc., in fact, all the wide range of silicates of alumina, potash, lime, soda, iron, etc.—seems, at this elevation of over 2,000 feet above tide, and in latitude  $30^{\circ} 40'$ , to be the home of the apple, pear, peach, plum, and other fruits, in a sense that means perfection in the fruit and unfailing crops, year after year, with the possible exception of the peach. Should railway transportation at last be supplied these counties, in order to develop their mineral resources, one of the first effects resulting would be the great stimulus given to the increased production of fruits and fine tobacco. The ores and minerals of greatest value in these systems of rocks—between the azoic, on the south margin, and the Huronian, on the north—are magnetic specular and brown ores of iron, sulphuretted ores of iron and copper, lead and zinc, manganese, gold and silver, nickel, mica, asbestos, granite, syenite, gneiss, steatite, baryta, feldspar, and potters' and fire brick clays, quartz, etc.

Beginning in Floyd and proceeding southwest, gold is found on Laurel creek; magnetic iron ore shows in a band two miles south of Floyd courthouse; at Tonneray copper mine four feet thick, and now and then throughout the range on the south side of Carroll and Grayson. Another great line of magnetites, commencing south of the gold belt in Floyd, and proceeding southwest near the great cop-

per veins of Carroll, becomes of high commercial importance in Grayson, both from its measures and great purity.

Two miles north of Old Town, in Grayson, and then south of Independence, near New river, and where the same ledges pass out southwest below the mouth of Wilson, in Grayson, these magnetites are quite valuable and extensive. Near these are occasional bodies of specular iron ores.

The copper ores, combined with sulphurets, are in large quantity at Toncray and other mines in Floyd, as oxides, carbonates and sulphurets, on what is familiarly known as the southern lode; then northwardly towards Laurel and Brush creeks, the sulphuretted lodes of copper and iron, which become so extensive in Carroll, seem to make some surface exhibits.

In Carroll county, on a line north of the courthouse, these great copper deposits, running northeast and southwest, are fully twenty miles in length, in veins over twenty-six feet thick, dipping southeast and frequently assuming a thickness above sixty feet, and sometimes 150 feet between floor and roof—generally this floor and roof is talco—micaceous slate, interspersed now and then with quartz. This deposit continues on southwest through Grayson, along a line near Old Town and New river, and passes on toward Ducktown.

Close analyses of these sulphuretted ores show them to average from 1.70 to 5 per cent. of copper, 40 to 46 per cent. of sulphur, and about 50 per cent. of iron. Their decomposition down to about forty-five feet below the surface has left large quantities of limonite on the surface, by which the veins are easily traced; down in the deposits, just above the undecomposed ores, are considerable bodies of black oxide of copper, copper glance, etc.

The tonnage from these deposits would necessarily be immense, once transportation was assured. Then again, south of Carroll courthouse are handsome exhibits of native copper, as shown at Sutphin's, Early's, etc.; copper pyrites is even built into the foundation of the courthouse in stone taken from the northeast continuation of what is known as the Peachbottom vein, a deposit that extends southwest through Carroll and Grayson into North Carolina.

The greater ledges of granite, gneiss, syenite, etc., are found in Grayson county, north of the courthouse, in Point Lookout and Buck mountains, and in Balsam and White Top mountains. Soapstone ledges are found near the great copper and sulphuret lode (south of it). Mica and asbestos are found in the southeast side of Grayson. Asbestos also in Floyd and Carroll, in the Blue Ridge, south side of the county, and the rest of the minerals named are generally distributed.

This plateau is noted for the perennial flow of its fine, clear streams; their volume and their fall per mile being such as to give them high importance and usefulness. New river, Little river and some of their larger tributaries will each give power of very large dimensions.

## BLUE RIDGE BY COUNTIES.

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### COUNTIES.

Floyd.

Carroll.

Grayson.

## BLUE RIDGE DIVISION.

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### FLOYD

was formed in 1831 from Montgomery. It is thirty-eight miles long with a mean width of eighteen miles, and has 234,023 acres of land, valued at \$809,579. Population, 13,255—white, 11,981; colored, 1,274.

It is surrounded by the counties of Patrick, Carroll, Pulaski, Montgomery and Franklin, and lies between two prominent ranges of the Blue Ridge mountains. The surface is rolling; the soil is fertile and well adapted to grain and grass. A correspondent, a prominent citizen of the county, emphasizes this statement as to the adaptation to grass, saying: "Indeed this is a county of meadows."

The products are tobacco, wheat, corn, oats, hay. Spring wheat has recently been tried with very encouraging results. Many fine horses, mules, cattle, sheep and hogs are raised in this county. The finer grades of tobacco are raised here, and bring a considerable revenue to the county. Fruit-raising is profitable. Grapes are successfully cultivated and the wild varieties are found everywhere. Ives, Concord and Norton's Virginia are found to succeed best.

It is watered by Little river and its many branches. This is an elevated and healthy region, and possesses a delightful summer climate.

Its nearest railroad is the Norfolk and Western, passing through the adjoining counties of Montgomery and Pulaski. It is hoped that the Franklin and Pennsylvania railroad will soon be extended into this county. The timber consists of white oak, red oak, black oak, chestnut oak, hickory, white ash, pine, walnut, dogwood, maple, blackgum and chestnut. About one-half of the area of the county is in original forest timber of the varieties named.

Minerals are found in different localities—gold, iron, copper and ochre; also, a very fine quality of soapstone and asbestos, in large quantities. The copper ore is very valuable. The soapstone is valuable in the construction of furnaces for smelting operations. Iron pyrites, yielding fifty per cent. of sulphur, is abundant. The gold discoveries on Laurel creek, in Floyd county, are proving valuable.

A correspondent furnishes the following:

"The land of this county is principally rolling, but very little of it is too steep to be conveniently cultivated. There is a sufficiency of bottom land on the numerous streams to produce all the hay necessary for the present wants of the farmers, who winter all the stock they can graze, and if we had a railroad, could increase the hay product so as to have a considerable quantity to ship from the county. The lands are well adapted to the growth of all the grasses; clover does well, and red-top or herds grass seems to come spontaneously, and makes the finest grazing we have. Meadows produce on an average about a ton and a half to the acre.

"The county is well supplied with fine timber—some walnut, considerable fine white pine, a vast quantity of the best white oak and locust, with the other oaks and hickories, which is very fine for the manufacture of wagons.

"The surface is, I suppose, as finely watered as can be found anywhere. It is very rare to find a piece of land, to the extent of ten acres, without a never-failing stream of cool water, as pure as can be.

"The county is well supplied with churches and public schools, and a good private school each for boys and girls at the courthouse. Jacksonville, the county seat, is a beautifully located town of five hundred inhabitants, has four good churches, three hotels and six stores, all of which have a good trade from this and a portion of Franklin and Patrick counties. Board can be had for ten dollars per month at either of the hotels. It is twenty-one miles from the courthouse to the railroad at Christiansburg. There is no better region than this county for those of the South and cities seeking rest and change of air during the hot summer months.

"There are some valuable minerals here undeveloped, and there is splendid water power at various places sufficient to run most any kind of machinery. No region is better suited to the raising of sheep, which rarely become diseased in this high country. Land is worth from ten to twenty-five dollars per acre—the average price is about fifteen dollars."

#### FLOYD COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Red Iron Ore*, from Ultizers' ford.
2. *Terra Cotta Clays with Soapstone*, from Dr. H. Clarks' leases, corner of Floyd, Carroll and Patrick.
3. *Arsenopyrite*, with 32 ounces of silver to the ton, from upper waters of Roanoke river.
4. *Seatite*, from near Floyd courthouse.
5. *Gold Ore*, from Brush creek, from W. H. Harman, Floyd courthouse.
6. *Kaolin*, from near Floyd courthouse, W. H. Harman.

#### CARROLL

was formed in 1842 from Grayson. It contains 350,961 acres, valued at \$665,217. Population 13,309; white, 12,977; colored, 332.

This is the central one of the three counties of that elevated plateau, formed by the bifurcation of the Blue Ridge range of mountains—Floyd and Grayson being the other two. The surface is much broken and mountainous, but there are many rich valleys and fertile plains, and the hill lands and mountain sides afford grass and pasture of the best description. The soil varies greatly in color and texture, but is generally fertile.

The productions are tobacco, wheat, corn, oats, grass and fruits. Fruits are produced in great perfection here, especially the apple and grape.

A large portion of the county is still in timber of the original forest growth, consisting mostly of oak and other hard wood trees. There are some very good bodies of white pine in the northwestern section of the county.

New river and many of its large tributaries flow through the county, and furnish much valuable water-power.

Carroll is without railroad facilities except in the northwest borders, near which runs the "Cripple Creek Branch" of the Norfolk and Western railroad into the southern part of Wythe.

This region is very rich in minerals, consisting of iron ores, copper, lead, zinc, steatite, mica, etc. The following specimens of minerals from this county were exhibited at the New Orleans Exposition :

CARROLL COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Copper*, carbonates and pyrites, in siliceous gangue, from Peachbottom veins at Dobbyns.
2. *Iron and Copper Pyrites*, from beded vein 28 inches thick and 20 miles long, near Cranberry Plains.
3. *Copper Sulphuret*, same locality as above.
4. *Iron Ore, Hydrated Peroxide*, from cap of pyrites beded vein, same place as 1 and 2.
5. *Native Copper and Gangue*, from Sutphin mine, averages 5 per cent. of metal.
6. *Mineral Water*, from Grayson Sulphur Springs.
7. *Copper and Iron Pyrites*, with copper carbonate and gangue, from ore bands southern side of Floyd and Carroll.
8. *Copper Pyrites*, from Wildeat mines, near Hillsville.
9. *Copper Pyrites and Magnetic Pyrites*, from Cranberry mines, near Hillsville.
10. *Magnetic Pyrites*, occurs in immense quantities in massive ledges.
11. *Mica-Schist*, occurs in large amounts near Hillsville, and is well suited for quarrying.
12. *Copper Pyrites*, from property of S. S. & J. E. Clayton, of 6 S. Gay street, Baltimore.

The following from Virginia Department of Agriculture :

13. *Iron Ore*, hematite.
14. *Iron Ore*, limonite, from Martin Dalton.
15. *Lead Ore*, from Martin Dalton.
16. *Iron Ore*, from same.
17. *Gneiss*, from J. J. McGrady.
18. *Mica Slate*, from same.
19. *Iron Ore*, from Martin Dalton.

GRAYSON

was formed in 1792 from Wythe. It borders on the North Carolina line, and is bounded by Smyth, Wythe and Carroll. The western portion is mountainous, but its eastern and central parts lie in a fertile valley, and comprise a fine farming section. The productions are corn, wheat, oats, &c. This is a good grass region, and raises a great number of cattle, horses, sheep, &c. Population, 13,068; white, 12,071; colored, 997. It contains 260,113 acres of land; assessed at \$565,556.

Bees and poultry thrive well. Fruit raising is an interesting and profitable business. The climate is pleasant and healthy, and the natural advantages of this section are very great. It lacks railroad facilities, the nearest road being the Norfolk and Western, passing through the adjoining county of Smyth.

This county has valuable mineral resources; copper (very rich), iron, mica, granite, asbestos and steatite are found here. An iron ore of peculiar character is found in Grayson and Wythe, yielding, it is said, in some cases, by usual smelting process, a metal having all the qualities of steel. There are also large deposits of ores of the same character as the celebrated Cranberry ores of North

Carolina, which are perhaps the best Bessemer ores ever discovered. The deposits in this county are a continuation of the same formation.

Grayson is one among the best-watered counties in the State. New river and its tributaries traverse every part of it and afford abundant water-power for all kinds of machinery. But owing to the lack of transportation little manufacturing is carried on. One or two forges partially supply the home demand for iron, and recently one or two woolen mills have been erected. Timber is abundant, consisting principally of white and yellow pine, white oak, red oak, chestnut oak, some walnut and cherry, chestnut, hickory, maple, &c.

The one great need of this county is a railroad, and it will be as great a boon to other parts of the State as to the county. Two or three lines of railroad have been chartered through this county, and it is confidently believed that some one of them will be built in the near future.

Grayson is becoming noted for the number of neat white churches which dot its hills and valleys, and which indicate to the stranger the religious sentiment of its people. Several high schools, as well as the public school system, are in a prosperous condition. New framed school houses are rapidly taking the place of the less comfortable ones heretofore used.

#### GRAYSON COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Magnetic Iron Ore*, from 3<sup>1</sup>/<sub>2</sub> vein, two and one-half miles from Old Town, metallic iron 70 per cent., Capt. C. R. Boyd.
2. *Magnetic Iron Ore*, from beds of Slaughter, Dunn & Co., from Capt. C. R. Boyd.

From Virginia Department of Agriculture.

3. *Hematite Iron Ore*.
4. *Pyrite*, S. M. Dickey.
5. *Chalcopyrite*, H. Williams.
6. *Gneiss*, H. Williams.
7. *Magnetite*.
8. *Magnetite*, black oxide of iron, from Maj. W. K. Armistead, of Abingdon.

APPALACHIA.

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Appalachia, with its long ranges of high mountains, shows in Southwestern Virginia some of its greater mountains so formed as to be well-calculated to call forth from a skilful general, as was General Washington, a remark meant to convey the idea that he would use them as an impregnable defence. Possibly he, in speaking in that sense of "the mountains of West Augusta," meant the very ranges that occupy the middle of Appalachia; and, apparently, make great natural fortresses, as Burke's Garden is in appearance.

This elevated mountain basin in Tazewell county, in the very heart of the great Clinch range, contains about 30,000 acres of the most fertile blue-grass land, and is surrounded by high, almost mural, mountain escarpments, all round, except at one point on the north side, where the waters of this singularly beautiful basin break through and form Wolf creek.

In the counties composing Appalachia doubtless there are many other localities of equal beauty and character as points of strategical importance; but this is slight indeed when compared with their value as the depositories of great mineral wealth, the storehouses of the rain and moisture, and the great barriers against the too sudden incursion of the great northern storms.

This interesting group of counties is made up, geologically, of the rocks between the earlier Palæozoic (leaving out the Primordial) and the lower carboniferous, inclusive, disposed in long, generally parallel lines, running northeastwardly and southwestwardly. Their rather irregular boundary line on the southeast pursues the general line of the great North mountains under various local names, as before stated, and having the Alleghany mountains a part of the way, and the eastern limb of the Cumberland mountains for a considerable distance on its northwest side. The whole territory, of about 3,800 square miles, is immensely important to the State for quite numerous reasons; among which, it may be stated, are the vast areas of superior grazing lands in limestone valleys, extensive forests of excellent deciduous and soft woods, and some of the most important mineral-bearing series of rock formations in the State.

The great crust of the earth was broken up several times in the cosmical action by which it was formed, giving five or six repetitions of the great bands of which it is composed, in most of its transverse sections, from which have resulted most valuable alternations of mountain and valley, of limestone grass-lands and wooded ridges and mountains. These mountains are usually composed of a greater and a lesser range, co-extensive and parallel—the larger holding the valuable iron and manganese-bearing rocks of the upper Silurian period, lying northwardly, and the smaller, the rocks of the latter half of the Devonian period, lying southwardly, with a valley of slate between. This smaller range frequently holds, on its south flank, valuable deposits of proto-carboniferous coal, as in Bland county and north

parts of Alleghany county; but in Giles and Craig counties these coal-rocks seem to be cut out by faults.

There is also a line of these very lowest of coal-rocks in the southwestern corner of Wise county, and thence southwest through Lee, along the east flank of the Cumberland mountains; but coal is not in them as it is in the great coal-rocks close on the north of them.

In some localities the larger mountains are great curved anticlines, giving valuable and extensive outcrops of iron and manganese ores (Rogers', numbers V to VII and VIII inclusive), as in the case of Rich Patch mountain, of Alleghany and north side of Botetourt county; Potts or Middle mountain, Alleghany county; Salt Pond mountain, in Giles, and Round mountain, in Bland county. These great anticlines are sometimes broken along their crests and spread apart longitudinally—apparently by some great end pressure—bringing to view the great fossil-bearing limestones of III and IV, as in the case of Sinking creek, Giles county, and of Burke's Garden and Thompson & Ward's coves, Tazewell county, thus accounting for the wonderful fertility of those areas, so high as 2,600 to 3,600 feet above the sea level. These repeated breaks in the great crust give such fertile limestone belts as those of Nanny's creek and Dunlap's creek, of Alleghany; the number VI limestone belt of Pott's creek; Sinking creek, of Craig and Giles counties; the great basin of New river in Giles county, and the lines of Wolf and Walker's creeks in Giles and Bland counties; Burke's Garden and the great coves and valleys of Tazewell, on Clinch and Bluestone rivers and tributaries; the great coves, valleys and rich limestone gardens of Russell county and of Scott county, and the like splendid grass valleys of Powell's Valley, in Lee county. Abb's Valley, in Tazewell, and upper Powell's Valley, of Wise, owe their rich limestone belts to like upthrows of sub-carboniferous rocks.

This region is marked by often repeated sections of some of the most valuable geological formations so far recorded; to go into any detailed description of which would necessitate the enumeration of nearly the whole range of rock strata comprised between the Archæan age and the carboniferous period, inclusive, with all their valuable stores of granite, syenite, gneiss, stearite, mica, asbestos, feldspar, quartz, glass sand, magnetic and specular iron ores, copper, gold and silver ores, nickel, manganese, tin, sulphur, zinc, lead, limonite and other ores of iron, barytes, gypsum, salt, petroleum, slate, honestone, grindstone, building stone, limestone, marble, cement stone, potter's and firebrick clays, and bituminous, semi-bituminous, splint, cannel and semi-anthracite coals, and thermal and mineral waters—beginning such description in the Archæan on the southeast or Blue Ridge side, and ending it in the carboniferous rocks on the northwest or Cumberland side. These various extensive bands or ledges of rocks, where they protrude above the surface, disclose a general strike or trend northeast and southwest, dipping at all angles, from positions almost perpendicular to nearly flat—the mountains and valleys generally showing the steeper dips, inclining usually to southeastward, while the strata of the Cumberland Plateau, or coal rocks, are found, in the main, nearly flat, with the whole broad expanse so presented to view as to render easily accessible much the greater part of the various minerals just mentioned.

The convulsions and disturbances of the earth's surface, by which the great mountains composing the Appalachian chain in Virginia were formed as a whole, acted in such a way as to erect numerous greater and lesser lines of nearly parallel ridges, separated from each other by valleys, many of which are several times broader than the bases of the mountains by which they are bounded—re-

sulting, as is the case in the great Southwest Valley and the valleys of the Holston, Walker's creek, Clear Fork, Clinch and Powell's rivers, and Giles and Burke's Garden basins, in the very extensive areas of fine grazing and farming lands, which owe their great natural fertility to the decomposition of massive bands of limestone, of which the rock material in these valleys, in great part, consists. But in these convulsions there were two most remarkable departures from the parallelism which marked their action throughout this region. One of them is shown on the easterly side of the Appalachians, in a great *bifurcation* of the Blue Ridge at the point where nearly join the counties of Roanoke, Floyd, Montgomery and Franklin, whence trend the two great arms of the bifurcation westwardly and southwardly, enveloping in their wide grasp the rich mineral plateau composed of the counties of Floyd, Carroll and Grayson.

The other remarkable evidence of this action is shown on the more westerly side of the Appalachians, in a bifurcation of the Cumberland mountain in Lee county, whence its two great arms trend eastwardly and northeastwardly, enveloping those noble coal areas comprised in a part of Lee county, nearly all of Wise, and the whole of Dickenson and Buchanan counties, and projecting a strip of coal rocks, of well ascertained value, into Tazewell, Russell and Scott counties. . . . . The Blue Ridge plateau, so enveloped as described before, shows only one or two ledges of limestone; but derives the great fertility, observed in much of its soil, from the decomposition of heavy bands of aluminous silicates of potash, lime, iron, &c.; while the nearly similarly shaped plateau of the Cumberland owes whatever of fertility its soils may possess, to the wearing of sandstones, slates, &c., holding organic matter of fossils with some lime variously combined, and, in a few localities, thin beds of limestones, intercalated between the much heavier strata of sandstone and slates.

The great mountains bounding, and often dividing the extensive valleys longitudinally, have a general elevation, above the valleys, of 1,000 to 1,600 feet, while the valleys are from 1,000 to 2,800 feet above sea-level.

On the southeast side of this extensive region is the Blue Ridge, forming in its straighter alignment and prolongation, the southeast boundary of the great Valley of Virginia, throughout its extent.

Passing over numerous broken ridges, in the Valley itself, the great North mountains, under various names, such as The Gap, Walker's and Clinch mountains, form the northwest boundary of the Great Valley, toward the southwest end, also forming the southeast boundary of Appalachia in the main; though the northeastward continuation of the Clinch range, after reaching Burke's Garden, and passing that lovely mountain basin, going northeast, divides Appalachia nearly in two—as is the case in Garden, Round Mountain and their south-flanking ridge (Big Brushy), Wolf creek, Pearis, Angel's Rest, Butte, and Salt-Pond mountains, upon which last, at an elevation of 4,700 feet above sea-level, is the famous Mountain Lake, the origin of which dates back a little more than one hundred years.

Then, north of this a short distance, a part of Appalachia is bounded northwest by Peter's and East River mountains—the boundary line, at the east end of Tazewell county, jumping across from East River mountain to Flat Top (near Pocahontas), which, with its continuations—Sandy Ridge and Stone mountains, &c., composing the eastern bifurcation of the Cumberland mountain—form the northwest boundary of Appalachia proper, toward the southwest.

Then, Trans-Appalachia holds on its northwest side, next Kentucky, the last of Virginia's great mountains—the Cumberland.

This important section of Virginia, so formed into such noble alternations of mountain and valley, hill and dale, of pasture and woodland, with its magnificent and inexhaustible repositories of mineral wealth, presents a topography, systems of drainage, and resulting atmospheric conditions of superior excellence, which, together with its position on favorable parallels of latitude, combine to render it equal, if not superior, to any area of like size in the world.

The different systems of drainage so established may be enumerated as follows:

1. That of James river, flowing east into the Atlantic ocean ; its tributaries watering this territory being Otter creek, Roaring Run, Stone river, Purgatory, Looney's, Catawba, Craig's, John's, Long's, Entry and Sinking creeks ; Jackson's river, Cow Pasture river, Wilson's, Mill, Pott's, Dunlap's and Indian Draft creeks, and many minor tributaries. These chiefly drain the counties of Bath, Highland, Botetourt, Alleghany and Craig, and a small part of Roanoke of this territory.

2. That of Roanoke river, flowing southeast through the Staunton and Dan rivers into the Atlantic ocean. Its tributaries, with which this paper is concerned, are Back creek, Wolf, Glade, Tinker's, Mudlick, Peter's, Craven's, Mason's, Mill creeks and others ; South Fork, North Fork and their tributaries draining a small part of Botetourt, the greater part of Roanoke county, more than half of Montgomery and a small area of Floyd county.

3. That of New river, which flows northward and northwest, forming the Great Kanawha, and delivers its waters through the Ohio and Mississippi rivers into the Gulf of Mexico. Its tributaries watering this territory are : East river, Wolf creek, Big and Little Stony, Doe and Sinking creeks, Mill and Walker's creeks, Morris' Run, Back, Tom's, Watt's, Strouble's, Crab, Plum, Peak and Mack's creeks, Little river and its tributaries ; Big and Little Reed Island creeks ; Pine, Reed, Poplar-Camp and Cripple creeks ; Crooked, Chestnut and Brush creeks ; Upper Little river and tributaries ; Elk, Peachbottom, Bridle, Saddle, Wilson's, Grassy, Helton, Big and Little Horse creeks, and many minor tributaries. All of which drain, in whole or in part, the following counties : Giles, Bland, southeast side of Tazewell, west end of Craig, much of Montgomery, Pulaski, nearly all of Floyd (except some water gaps in Blue Ridge by the headwaters of the tributaries of Dan river), Wythe, a small area of Smyth, Grayson, and all of Carroll except that part which overlaps the Blue Ridge and is drained by the headwaters of Ararat, a tributary of Dan river.

4. The drainage by the system of the Tennessee river, subdivided into : (a) that of the south, middle and north forks of Holston river and their tributaries ; (b) Clinch river and tributaries ; and (c) Powells river and tributaries, all of which, when united in the Tennessee river, flow westwardly, thence through the Ohio and Mississippi rivers into the Gulf of Mexico. These drain, in whole or in part, the counties of Symth, Washington, Tazewell, Russell, Scott and Lee, and a large area of Wise county.

5. The Louisa, Russell and Pound Forks of Sandy river and their tributaries, draining the counties of Buchanan, Dickenson and a large part of Wise, and flowing northwardly into the Ohio river.

These five extensive drainage systems, deriving their erosive power no less from their constancy than their great flood volumes, have, in the course of time, greatly modified the topography of this region. But, as in the case of John's creek, a tributary of James river, whose head springs are quite 4,300 feet above the sea, near Mountain lake ; tributaries of New river, rising on White Top and Balsam mountains, fully 5,400 feet above tide ; headwaters of Holston river, rising at Bear

Town, near Burke's Garden, 4,700 feet above tide; and of Powell's river at Stone mountain, 4,000 feet above the sea, we have left to us, by these streams, and, also affected by the agencies of ice and snow, these splendid contrasts in the elevations and depressions to this section's topography, which not only secure to the region a healthful and invigorating summer climate, that is fast tending to make it the sanitarium of the South, but adds no less to the beauty of the scenery than security against any lengthened failure of rainfall.

NOTE.—In the foregoing general description of "Appalachia" it is not clearly stated that in this division is included all of Virginia west of the great Valley, the sub-division defined on the small map as "Trans-Appalachia" being treated as a part of the Grand Division. The great Appalachian chain, which is regarded as the dominant feature of the mountain system composing this region, gives its name thereto, and the term has not a very well-defined application, but it is sufficient for the present purpose to state that it comprises the thirteen counties west and north of the Valley Division.

To avoid confusion, attention is again called to the fact that county lines do not correspond accurately with the geological divisions of the State. It will be observed (see small map) that a strip of Appalachia extends along the whole tier of the Valley counties, taking in the western edge of Augusta, Rockingham, Shenandoah and Frederick, but by far the greater part of these counties being in the Valley, the edge projected into Appalachia is not considered separately.

And only the southern section of the "Blue Ridge," where it broadens out into the "plateau" embracing the three counties of Floyd, Carroll and Grayson is taken account of separately, the long, narrow "ridge" north of Floyd being divided between the Valley and Piedmont.

As was natural, the writer of the last papers has regarded his subject with the eye of a geologist and mineralogist rather than with that of a farmer, and perhaps has not brought out the magnificent *agricultural* capabilities of this favored region as prominently as might be desired and deserved. In truth, the mineral wealth of the country described is so vast that it could hardly fail to engross the attention of a specialist to the exclusion of other subjects of consideration. At a future time I hope that these other parts of the picture will be filled in by a hand as eager and as full of the subject as the writer of the last paper is of his specialty.—COM. OF AGRICULTURE.

## COUNTIES OF APPALACHIA.

## NATURAL SUB-DIVISIONS.

## COUNTIES.

Sources of James.....	{ Highland. Bath. Alleghany. Craig.
New River Country.....	{ Giles. Bland.
Clinch River Country.....	{ Tazewell. Russell. Scott. Lee.
Sources of Big Sandy, or Trans-Appalachia.....	{ Buchanan. Wise. Dickenson.

## APPALACHIA BY COUNTIES.

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### ALLEGHANY

was formed in 1822 from Bath, Botetourt and Monroe. It is twenty-six miles long and has a mean breadth of twenty miles, with an area of 4'3 500 acres, assessed at \$958 000. Population—white, 4,454; colored, 1,132; total, 5,586.

The surface is very much broken, and mountainous but there are some considerable areas of valley lands of the finest limestone soil, producing excellent crops of tobacco, grain, fruit and grass. The main business of the farmers is grazing and rearing cattle, horses, sheep and swine. The mountains are clothed with immense forests of valuable timber, and are filled with iron ores of great purity and value. These ores have been largely developed and worked in the various furnaces in the county, of which "Clifton Forge," "Low Moor" and "Longdale" are the principal. Pig iron is turned out by these furnaces in great amounts and at low cost.

The county is watered by Jackson and Cow Pasture rivers, which unite near the eastern border and form the James. The Chesapeake and Ohio railway traverses this county centrally, passing through Covington, the county seat. The Richmond and Alleghany railroad connects at Clifton Forge with the Chesapeake and Ohio railway, and with its easy grades affords much relief to the heavy hauling of the great amount of metal from this region.

This is a healthy region, and the summer climate is delightful. The mountain lands are cheap, and no doubt capable of being utilized to a much greater extent than now in the stock-raising business.

Covington, the county seat, is a place of commercial importance, very favorably situated for trade. Low Moor, eight miles lower down on the Chesapeake and Ohio railway, is rapidly growing into a manufacturing town, the great iron works here being the nucleus. Clifton Forge, at the junction of the Chesapeake and Ohio and Richmond and Alleghany, is fast becoming an important town.

#### ALLEGHANY COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Fossil Iron Ore*, from Clinton, No. V, beds in Clifton Forge Pass, Richmond and Alleghany railroad.

From Low Moor Iron Company.

2. *Limonite Iron Ore*, lump, from company's mine in No. VII, Oriskany.
3. *Limonite Iron Ore*, washed, from same.
4. *Limestone*, No. VI, Lower Helderberg; from quarry No. 1, used for flux.
5. *Coke*, made at Low Moor furnace, in company's ovens, and used in that furnace.

6. *Coal*, from No. XII, or lower coal measures; from New River field of West Virginia on Chesapeake and Ohio railway, from which above coke was made.

7. Sample of *Coke Pig Irons* made at Low Moor furnace from above ores; No. 1, foundry pig; No. 2, foundry pig; No. 1, mill pig; No. 2, mill pig; No. 3, close mill pig; No. 4, silvery pig; No. 5, mottled pig; No. 6, white pig; No. 7, part of "Salamander" blown from furnace "well" with "Atlas" powder after blast No. 2 of Low Moor furnace.

18. *Limonite Iron Ore*, from Iron Mountain mines on Pounding Mill run.

19. *Stalactites and Stalagmites* and other cave rocks from a cave in Lower Helderberg, No. VI, limestone, near Low Moor station, C. & O. railway.

20 to 23. Five boxes Pig Iron, grades from No. 1 to mottled, inclusive, with the characteristic cinder for each grade; from the Longdale furnaces.

24. Box of Lower Helderberg, No. VI, limestone, used for flux in Longdale furnaces.

25. Box of Coke, used in Longdale furnaces, from the Sewell coal bed, and ovens of Longdale Company, at Sewell, West Virginia, from New river or No. XII, Lower measures coal.

26. Box of lump ore, brown hematite, from Oriskany, or No. VII, from mines of Longdale Company, in Brushy mountain, near head of Simpson's creek.

27. Unwashed ore, or pay dirt, of above mines.

28. Washed ore of above mines.

29. Refuse from washer in washing above ores.

30 and 31. Clay and flint from top and bottom, respectively, of above iron mines.

32. Lump of *Cadmia*, from deposition from fumes in throats of Longdale blast furnaces.

33. *Limonite*, brown iron ore, lump weighing 625 pounds and box, from west side Peter's mountain, on Dunlap creek, two and a half miles south from Trice switch of C. & O. railway, from mine of Keyser & McAlister, of Backbone, Va., from which some 25 tons are daily shipped to Etna Iron Works, Ironton, Ohio.

34. *Limonite*, brown iron ore, from fine deposit in No. VII, Oriskany, at lower end of Clifton Forge Pass, R. & A. railroad.

35. *Limonite*, brown iron ore, No. VII, or Oriskany, from cuts 1, 2, 3 and 4, and washed ore, from the "Stack" mine, near Backbone station, C. & O. railway.

36. *Limonite*, brown iron ore, "lump" and "pipe," from Rumsey mine.

37. *Hematite, Specular or Magnetic Iron Ore*, from Rumsey mine.

## BATH

was formed in 1790 from parts of Augusta, Greenbrier and Botetourt, and is now one of the border counties. It has an area of 538,368 acres, assessed at \$848,563. This shows a very low valuation; but the large proportion of waste mountain land explains this. Some of the valleys are exceedingly fertile and beautiful—the soil formed from disintegrated limestone—producing grain and grass luxuriantly; even in the mountains there is good grazing; so that this is a most excellent stock-raising county, beautifully watered by clear mountain streams, flowing into the Jackson and Cow Pasture rivers, which meander through this county and unite some miles below, near the borders of Alleghany and Botetourt.

The population of this county is small, only 4,482; white, 3,521; colored, 961; or about five to the square mile; but the people are independent and prosperous, having a healthful and beautiful pastoral country. Schools and churches conveniently located.

The Chesapeake and Ohio railroad passes through the southeastern part of the

county, giving an outlet for the abundant products, and access to the many attractive watering places of this county. A good turnpike runs through from east to west, and the county roads are improving in condition. Nature has been prodigal to Bath in respect to mineral springs. The Warm Sulphur, the Hot, the Healing, have long been celebrated—the "Warm Sulphur" for near a century. Here is the county seat, "Warm Springs," an attractive village in the rich "Warm Springs Valley." In the southeastern part of the county, near the railroad, we have another group, the Bath Alum, Millboro', and Wallawhatoola. To these resorts multitudes of summer visitors are attracted by the health-giving waters, pure air, lovely scenery, fine fishing and shooting, and excellent fare of this favored region.

There is much iron ore in this county, and some of it has been worked successfully for many years. A promising vein of coal has lately been found near Bath Alum.

A correspondent writes :

"We have in the county all kinds of timber indigenous to the mountains of Virginia, such as oak, pine, hickory, ash, &c. There are in the county eight flouring mills, some of them with the improved methods for making flour. We have several steam saw mills constantly at work, one planing mill, and another almost ready to run, at which all kinds of supplies for house building will be manufactured. The land along the rivers and creeks is quite productive, and yields good crops of the various grains and grasses. The upland and mountains afford fine range for stock, particularly sheep, which is a growing industry. Our people lack the capital to develop either the mineral or agricultural wealth of their county, and would gladly welcome any who would come among them to assist by their money or labor."

#### BATH COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Virginia Department of Agriculture.

1. *Limonite Iron Ore*, No. VII, Oriskany, from Joseph Baxter, Esq., Bath Alum Springs.
2. *Manganese Ore*, from Col. Wm. McClintic.
3. *Red and Brown Iron Ores*, from J. C. Harvey, Esq.
4. *Kaolin*.
5. *Ochre*, deep red, from deposit on land of Mrs. M. M. Bratton, on Mill creek, near C. & O. R. R. Contributed by Rev. Samuel Brown, Millboro'.

#### BLAND.

Bland county was formed in 1861 from Wythe, Tazewell and Giles. Seddon is the county seat, and is located in the Walker's creek valley, near the centre of the county, with turnpikes diverging east, west, north and south. Several mountain ranges traverse the county from northeast to southwest, making beautiful and fertile valleys, with rolling hills between, threaded by streams as clear and sparkling as the dew of heaven. These mountains are filled with chromic, hematite, magnetic, paint and specular iron ores, lead, kaolin, ochre, barytes, copper and slate; are covered with a heavy forest of oaks, chestnut, hickory, ash, walnut, poplar, cucumber, lind, locust, pine, maple, both hard and soft. There is no outlet for this untold wealth that is mountain-bound and locked up where nature formed it. Several railroad lines have been projected, and there are good hopes of some of them being built in the near future.

There are several mineral springs in the county, the most noted of which are Sharon springs and Kimberling springs. The former are seven miles west of Bland courthouse, on the turnpike leading from Wytheville to Jeffersonville. These springs are recommended in scrofulous diseases. At these springs there is a vein of coal eleven feet and four inches thick, and said to be of the finest quality.

Kimberling springs are seven miles north of Bland courthouse, ensconced right in the bosom of the mountains, with all the charms that belong to nature in her silent and dreamy mood.

Bland is a grazing county, and her capacity for grazing is being increased every year. She is not far behind the foremost counties in the State in the number of fine fat bullocks sent to the eastern markets. The sheep industry is profitable, and is increasing every year, and would increase more rapidly if the cultivation of the miserable dog was abandoned. Horses, mules and hogs of good blood are raised for home use, besides a great many for market.

Population—white, 4,750; colored, 254; total, 5,004. Number of acres of land, 220,820, assessed at \$433,053. Value of town lots, \$19,195.

The waters of the eastern portion of the county flow east and empty into New river, while those in the western portion flow west and empty into the Holston river; Sharon springs being the head waters of the Holston river, and are 2,849 feet above the level of the sea.

Wheat, corn, oats, rye and buckwheat are cultivated to perfection; some tobacco is raised, though not much. Nearly all the domestic grasses are cultivated. Blue grass, *poa pratensis*, comes of its own accord, being a native of the soil, and is the king of grasses.

Apples, peaches, pears, plums, cherries and grapes do well when properly attended to. Many varieties of grapes grow wild, some of which make a fine quality of wine.

The county is well watered with the finest of springs, of both lime and free-stone water, and several large creeks, affording plenty of water and the finest sites for all kinds of machinery, with plenty of sandstone, and blue and gray limestone for building purposes.

The finances of the county have been well managed, and the county is out of debt.

The people are sober, industrious and thriving, possessed with as much energy as the people of any county in the Commonwealth; and be it said to the honor of her citizens, that there is not a bar room in the county, and has not been for years. Her people always extend a welcome hand to all who are seeking homes, or permanent investments, to come into her borders and help build up, and develop her latent wealth hid in the earth, and set the waters to humming to the music of the spindle, and the loom, and the locomotive.

Good churches are found in almost every neighborhood, with as much toleration and as little bigotry as can be found among Christian people elsewhere.

#### BLAND COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Captain C. R. Boyd.

1. *Brown Iron Ore*, large deposit in No. III; lands of S. H. Newberry.
2. *Specular Iron Ore*, fine quality, from base of No. III; lands of Newberry and others.

3. *Brown Iron Ore*, cubical pseudomorph after pyrites; lands of Harman Newberry.
4. *Iron Ores*, from No. X, from south foot of Brushy mountain, near Sharon springs; land of Newberry and others.
5. *Coal*, from No. X, proto-carboniferous, near Sharon springs; lands of Newberry and others.
6. *Red and Brown Iron Ores*, from No. VIII, slates, from Round mountain, Hunting Camp and Wolf creeks.
7. *Brown Iron Ore*, compact, from rocks overlying No. VII, Oriskany; good for basic process.
8. *Fossil Petraia Corniculum*, from No. III.
9. *Red and Brown Iron Ores*, splendid, from underlying rocks of VII, Round mountain; large deposits; 56 per cent. of metallic iron; 0.08 phosphorus; lands of Peery and Boyd.
10. *Marble*, nearly white, from land of Sam. H. Newberry.
11. *Mineral Water*, from Sharon Alum and Chalybeate Springs.
12. *Manganese*, silicide of, from Round mountain, lands of Peery and Boyd.
13. *Brown Iron Ore*, fibrous, from large beds in Round mountain, lands of Peery and Boyd.
14. *Fossil Iron Ore*, from 20-foot bed of No. V, Round and Garden mountain, lands of Peery and Boyd.

The following from the cabinet of the Virginia Department of Agriculture:

15. *Chert*, in limestone in form of moccasin.
16. *Ochre and Iron Ore*, from Iron mountain.
17. *Iron Ore*, red, from Iron mountain.
18. *Tufaceous Marl*.
19. *Lead and Zinc Ores*.
20. *Manganese*.
21. *Barytes*, on limestone.
22. *Feldspar*.

#### BUCHANAN

was formed in 1858 from Russell and Tazewell. It contains 490,848 acres,\* assessed at \$285,989. Population—white, 5,661; colored, 33; total, 5,694. It lies on the western slope of the Alleghany mountains, and has two of its sides the dividing lines separating Virginia from West Virginia and Kentucky. Much of the surface is rugged and mountainous, but the soil is fertile and well adapted to grass, and its great elevation gives it a moist, cool climate, well suited to grazing and cattle raising. The valleys especially are fertile, and produce excellent crops of all the cereals. The lands are very low priced, and are held in immense tracts

\*The returns in the Auditor's office make the county much larger—i. e., 752,211 acres.—but I am convinced that the figures given above are much more nearly correct. Much of the land is held in immense tracts; a single one calls for more than 200,000 acres, and it is a well known fact that the old surveys frequently overlap, the lines crossing each other in utter confusion. To show how unreliable the returns are, the Auditor's Report of 1876 gives the number of acres 911,357; in report of 1877 it was credited with 937,272—nearly 76,000 acres more than in the preceding year, although the county limits remained the same. In 1880 the county of Dickenson was formed from parts of Buchanan, Russell and Wise, but this cannot account at all satisfactorily for this great variation in the returns of the number of acres in Buchanan before and since that time. Unless all the maps to which I have access are very faulty in the scale of proportions, it is impossible that Buchanan can have more than 400,000 or 500,000 acres, if so much as that.—C. A.

by speculators and persons interested in mining. Minerals exist in vast quantities, and consist mainly in iron ores, coal and salt, undeveloped and waiting for the coming of railroads. With good transportation there would soon be exploited in this county the immense resources of minerals and of timber now lying undeveloped. The cattle business could be cheaply prosecuted on a large scale if the requisite capital was invested in this fine grazing country. This region, for which Nature has done so much, is now attracting attention, and cannot long remain cut off from the outer world. An inviting field is offered here for settlers, as the lands can now be bought for a tithe of the value they will have when railroads penetrate these rich valleys.\*

### CRAIG

was formed in 1850 from Botetourt, Roanoke, Giles, and Monroe (now a county of West Virginia). Area, 242,961 acres, assessed at \$566,279. Population—white, 3,558; colored, 236; total, 3,794. The surface, like all this section of the State, is rugged and mountainous. The soil is fertile, and peculiarly adapted to the growth of rich grasses. Accordingly we find here a pastoral life among the people, and much fine stock. A large proportion of the surface is in original forest of superior timber, as white oak, ash, hickory, maple, and other valuable woods. The timber of this section of the State is noted for its hardness and great strength. The county is watered by Craig's creek, which flows northeast and empties into James river at Sheets, in the neighboring county of Botetourt, and by Sinking creek, which flows southeast and empties into New river, in Giles. New river flows north into the Kanawha, a tributary of the Ohio. Thus the waters from a part of this county run to the Atlantic ocean through the James, and from another part, across the water-shed, make their way through the Ohio and Mississippi to the Gulf of Mexico. The minerals consist mainly of iron, manganese and slate. Indications of silver have been found here. Cheap homes and a salubrious and pleasant climate add to the attractions of this section for settlers.

Craig is now somewhat isolated in respect to railroad facilities; but the day is probably not distant when a railway will be constructed along the valley of Craig's creek into the rich coal district of West Virginia. There is probably immense mineral wealth in the mountains of Craig adjacent to the track which nature has marked out for the road.

### CRAIG COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Slate*, from Craig's creek, of superior quality and in great quantities.
2. *Manganese*, seven miles west from New Castle, and two from preceding.
3. *Manganiferous Iron Ore*, from Kyle's on John's creek, six miles northwest from New Castle.
4. *Slate*, four specimens from "Custer" quarry on Craig's creek, six miles southeast from New Castle.
5. *Iron Ore*, from John Goode, four miles southeast from New Castle.
6. *Manganese*, four large specimens from "Damewood" mine, from near same locality.
7. *Manganese*, two specimens from J. E. Custer's, six miles from New Castle.
8. *Slate*, from Jones quarry on Craig's creek, five miles southeast from New Castle.

\*The day is probably not far off when a railroad will touch the western corner of Buchanan (see note on Dickenson county), and others will be constructed as feeders to the main line.

## DICKENSON

was formed in 1880 from Russell, Wise and Buchanan. It is nearly a parallelogram with two sides of twenty-one miles and the other two of fifteen miles in extent, and contains about 193,112 acres, assessed at \$110,796. No census of the population was taken in 1880, but it is supposed to be about 4,000. It is bounded on the northwest by the Cumberland range of mountains, which separate it from Kentucky, and on the southeast by the Big Ae mountains. The surface on these borders is very rugged, but in the central parts it has many fine valleys and much fertile land. The products are wheat, corn, oats, rye, barley, buckwheat, tobacco, flax, melons and grass. Vegetables and fruit are raised in great abundance and of good quality. This and the other counties of Trans-Appalachia are in the great grazing region of the southwestern part of Virginia. The lands vary in texture with the character of the prevailing rocks, but the greater part of them are good grass lands. Timber of the most valuable kinds is found here in great abundance—three-fourths of the area being in original forest of oak, hickory, poplar, elm, ash, maple, wild cherry, walnut, pine, &c. The average assessed price of land being little more than twenty-five cents per acre, this region should afford grand inducements for men with capital to engage in the stock-raising business. This county is without railroads, but this want will probably soon be supplied. A most important road has been projected from the region of the rich Bessemer ores (Cranberry) of North Carolina, by Bristol, Tenn., through the counties of Washington, Russell and Dickenson, touching the corner of Buchanan, into Kentucky, and down the valley of the Big Sandy to Catlettsburg, thus opening communication with Ironton, Cincinnati, Louisville and other cities of the West, and with the East and Southwest by way of Bristol. This road has been surveyed through the pass or canyon where the Big Sandy breaks through the Cumberland mountains, making a sheer cut with perpendicular walls of immense height. This pass—aptly called “The Breaks”—presents, it is said, the grandest scenery to be found east of the Mississippi, only equalled in the United States by the canyons of the Colorado and the Arkansas. It is the gateway of the Cumberland mountains.

Dickenson is watered by the head streams of Russell's Fork of Big Sandy river flowing north into the Ohio. The minerals of this county have not been developed, but iron ores and coal (bituminous, splint and cannel) are known to be abundant, and many mineral waters of great value to the invalid.

## GILES

was formed in 1806 from Montgomery, Tazewell and Monroe, and is now one of the frontier counties of the State, adjoining Mercer and Monroe counties, of West Virginia. The eastern and western portions of the county are mountainous, both the boundaries being formed by ranges of the Alleghany mountains. Some portions of the county are very fertile, producing fine crops of cereals and grasses. This county is a fine grazing region, and produces some of the finest fat cattle that are sent to the eastern markets. There are several mineral springs in this county—places of popular resort during the heated term—the most noted being the “New River White” and “Hunter's Alum.” That wonderful freak of nature, the so-called “Salt Pond,” in the mountain of that name, attracts many visitors.

Giles is watered by New river and its tributaries. The population is—white, 7,685; colored, 1,109; total, 8,794. Number of acres of land, 275,492, assessed at \$982,753. It abounds in fine growths of the usual timber of this region—walnut,

wild cherry, sugar and other maple, oak, &c., and vast beds of iron ores, copper and coal.

In Giles there is found red marble, near Chapman's ferry and near the base of Angel's Rest mountain. Hydraulic limestone, near Chapman's ferry, contains of carbonate lime 43 per cent., and of carbonate magnesia, about 35 per cent.; silica, 17.30, and 2 per cent. alumina and oxide of iron. That a little below Chapman's ferry has 53 per cent. of carbonate lime, and 43 per cent. of magnesia, and 2 per cent. silicea, and 0.50 alumina and oxide of iron. These are highly hydraulic.

The branch road of the Norfolk and Western railroad from Central station, on the borders of Montgomery and Pulaski, passes nearly due north through the northeast end of Pulaski, and through the centre of Giles to the West Virginia line, and through Mercer county, West Virginia, in a southwest course to Graham and Pocahontas, in Tazewell, and is to be extended into the central parts of the latter county, where it will tap one of the finest mineral and timber regions in the world. Before this road was made the county of Giles labored under great disadvantages, but has already felt the effects of being brought in easy reach of the markets of the world, and is reaping rich fruits from her valuable mineral and forest wealth so long shut up among her hills and valleys. There is here a great opening for immigration, which will not long neglect a region so inviting.

#### GILES COUNTY MINERALS AT NEW ORLEANS EXPOSITION.

1. *Fossil*, *rhusophyceus bilobatus*, from No. 1, on Little Stony creek; Captain C. R. Boyd.
2. *Marble*, from Charles H. Snidaw, Kimballton.
3. *Red Iron Ore*, from regular stratified bed, showing abundance of it; C. W. McClaugherty.
4. *Clay and a mug made from it*, of fine quality for refractory purpose; C. W. McClaugherty.
5. *Red Iron Ore*, from D. F. Hale, Narrows; metallic iron 68.44 per cent.
6. *Spotted Marble*, from J. H. Hoge.

#### HIGHLAND

was formed in 1847 from Pendleton and Bath. It is nearly a square of about twenty miles each way, and contains 250,793 acres, assessed at \$793,313. Population—white, 4,715; colored, 449; total, 5,164.

This is an elevated mountain region on the northwest line, dividing Virginia from West Virginia. The soil is mostly limestone, and produces good crops of corn, wheat, oats, rye, buckwheat and grass. The Kentucky blue grass springs spontaneously wherever the timber is removed, and furnishes the finest pasturage, not inferior to that of the best lands of Kentucky. Grazing and the rearing of horses, cattle, sheep and swine constitute the main reliance of the owners of the soil. There is no place where a living is more easily made and where the people enjoy more of ease and leisure. The climate is healthy and invigorating, and the people are kind and hospitable.

Valuable timber, especially walnut and wild cherry of the very best quality for cabinet makers' use, is abundant, and when this section shall be endowed with railroad facilities it will constitute a large item of wealth. Iron ore, coal and marble are known to exist in abundance in this county, and probably other valuable minerals will be found when its access to market shall justify more extended explorations.

Monterey, the county seat, and McDowell are the principal villages, and are busy and growing places, notably the former.

This county is drained by the head waters of Cow Pasture and Jackson rivers emptying into the James, and by some of the head streams of the South Branch of Potomac river, which interlace in this elevated water shed of the two river systems, and mark out the track of the great line of railroad which has been projected and will at some day not distant connect Pittsburg with the inexhaustible deposits of iron ore in Alleghany, Botetourt and the adjoining counties, and will quadruple the value of the lands of Highland.

A correspondent has furnished a sketch of Highland county, which is added to complete the description, although there is some repetition of the features of the foregoing :

"This county is in the western, or rather northwestern part of Virginia, bounded west by the Alleghany and east by the Shenandoah mountains, and is on the high dividing lands between the James and Potomac waters, from 1,500 to 4,500 feet above the sea, and contains 390 square miles.

"The surface features are greatly varied, consisting of little ranges of mountains and hills, between which are quite sterile and productive valleys. These little ranges up from the cleared lands are covered with a luxuriant growth of timber, consisting of the different kinds of pine, walnut, chestnut, wild cherry, white, red and chestnut oak, poplar, lind, sugar maple, hickory, &c., millions of feet of which could be made valuable by the aid of the streams, on which logs might be floated either north by the South Branch and North Fork waters leading to the Potomac, or south by the Bull Pasture, Cow Pasture and Jackson river waters running into the James, affording excellent advantages for lumbering.

"The climate is, especially in summer, as healthy and as pleasant as any in the State. Highland has a rich soil. In the western part the valleys are mostly a limestone, quite productive of all kinds of grain, and being specially adapted to grass is the fine grazing portion of the county, and is for this purpose among the best in the State. The middle and eastern parts are more inclined to be sandy and slaty, and produce fine crops of grain and fruits. Agriculture, combined with stock raising, is the leading occupation. Corn, wheat, rye, buckwheat, potatoes, oats, hay and orchard products are raised. Butter, honey, cheese, wool, dried fruits and maple sugar are also produced. But few of these articles, however, are raised in greater quantities than will support the population, owing to distance from regular markets and the lack of railroad facilities for shipping. Therefore grazing and the shipping of live stock may be considered the most remunerative.

"The undeveloped resources of this county lie in the ores, iron and other kinds, and in the great forests of valuable timber that skirt the mountain sides.

"This county leads the State in maple sugar; is second in buckwheat; has a large wool clip, and noted pasture and meadow lands.

Monterey (population 300), the county seat, is on the Staunton and Parkersburg turnpike, which is a fine road, and runs through the centre of the county. All the county roads are fair.

"We have public schools all over the county in every settled portion, besides a graded and normal school at Doe Hill, and an academy at McDowell in the eastern part."

#### LEE

was formed from Russell in 1792. It lies in the southwest corner of the State, bordering on Tennessee and Kentucky. Its greatest length is sixty-five miles;

mean breadth, ten miles. It contains 292,271 acres, valued at \$1,087,438. Population—white, 14,192; colored, 924; total, 15,116. Three-fifths of the surface is mountainous or hilly, but the mountains are rich to the top, and a large proportion of the soil of the entire county is very fertile. The timber consists of oak (an immense quantity of *white* oak), poplar, pine, maple, buckeye, birch, beech, ash, cucumber, mulberry, locust, hickory, chestnut, much black walnut and wild cherry, with vast forests of red cedar, near Powell's river, of the best quality for the manufacture of cedar ware. The productions are corn, wheat, buckwheat, oats, rye and tobacco. The cultivation of tobacco is on the increase. A great variety of vegetables and fruits is produced. It is well watered by Powell's river, which is navigable for flat boats, and gives an outlet for the products of the county. The county is rich in minerals. Poor Valley ridge, which runs parallel to Cumberland mountains through the whole length of the county, has a rich vein of iron ore (dyestone—red hematite) extending throughout the entire length. The Cumberland mountains contain inexhaustible supplies of the best bituminous coal, a part of which is in this county. There are strong indications of zinc, lead and other valuable minerals. Salt has been made at two points in this county, but there are no works now in operation.

About one-half of the area of the county is cleared land, one-tenth of which is in wheat, the remainder in oats, rye, corn, tobacco and grass. This is a fine grass county, and is famous for fine cattle, horses, &c. It has, moreover, at least 2,500 acres in orchards of every variety of fruit.

#### LEE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

Collected by Gen. Imboden.

1. *Coal*, from "Imboden" vein 10<sup>8</sup> thick, from Crab Orchard, 10 miles southwest from Big Stone Gap.

2. *Fossil Iron Ore*, Clinton, No. V, 2 blocks from Rufus A. Ayers, on north fork Clinch river.

The following are from the Virginia Department of Agriculture :

3. *Fossil Iron Ore*, Clinton, No. V.

4. *Fossil Iron Ore*, Clinton.

5. *Limonite*, brown iron ore.

#### RUSSELL

was formed in 1786 from Washington. It contains 300,873 acres, valued at \$957,430. Population—white, 12,634; colored, 1,280; total, 13,914.

The surface is much broken, as the county lies among mountain ranges, and much of the land is not arable, but there are very fine lands in the valleys. Grazing and stock raising is one of the principal industries of the people of Russell. They produce also ample supplies of grain, &c., for man and beast, and are making tobacco of very fine quality.

This elevated mountain region is noted for its healthy and bracing climate, and offers, with its cheap grass lands, kept fertile by decomposition of fossil limestones and feldspathic rocks, fine locations for persons desiring to go into the cattle business. The number of fat cattle annually sold amounts to 10,500.

It is drained by Clinch river, which is navigable by batteaux, and tributaries, which afford immense amounts of water-power, and are well stocked with game

fishes. Moccasin creek, a tributary of the Holston, waters a considerable portion of its southern part.

The timber of this county is of the most valuable kinds, of large size, and in great abundance. The minerals are iron ores, coal, lead, zinc, barytes, salt, sand-stone, limestone and marble, and are found in great abundance, of good quality and easily mined. There are several mineral springs in Russell.

This county will be greatly benefited by railroads, which are expected to be constructed in the near future. Three lines of railway are now chartered, which will give to Russell nearly all the facilities it will require. The Richmond and Southwest railway will run thirty miles through the Clinch river section. The Saltville and Coal Mine railroad will cross the county diagonally from southeast to northwest, crossing the iron, marble, coal and timber belts. The Virginia, Kentucky and Ohio railroad has a branch road provided for in its charter which might pursue the line of Clinch river, on its way to Pound Gap.

#### RUSSELL COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

1. *Splint Coal*, from Lewis Creek; from Captain C. R. Boyd.
2. *Coal*, from Chana creek; contributed by Elijah Rasnick, Sr., of Pat's Store.

The following were contributed by Major W. K. Armistead, of Abingdon :

3. *Marble*, variegated, from base of Clinch mountain.
4. *Bituminous Coal*, from Dump's creek.
5. *Coke*, from Dump's creek coal.
6. *Splint Coal*, from Dump's creek.

#### SCOTT

was formed in 1814 from Lee, Washington and Russell. The surface is mountainous and rolling, and the soil very good. Copper and Clinch rivers traverse the centre, and the North Fork of Holston the southern part.

Population—white, 16,557; colored, 676; total, 17,233. Number of acres of land, 327,673, assessed at \$756,095.

The productions are corn (in very large quantity), wheat, oats, rye, grass and tobacco. Price of land, improved, from \$5 to \$50 per acre; unimproved, from \$1 to \$5 per acre. This county has great capabilities, and with railroads would ship largely, both of the products of the farm and of the mines. Two-thirds of the surface is in timber, consisting of several kinds of oak, poplar, walnut, ash, lind, beech, sycamore, elm and box elder. There are 2,000 acres in orchards of apples, peaches, pears, cherries, grapes, &c. There are 80 schools in the county, of which 70 are public, and are in a flourishing condition. There are 75 churches, 35 of which are Methodist, 20 Mission, 10 Hard-shell Baptist, and 10 Free-will Baptist. About 300 immigrants have settled in this county in the last few years. This is a grass county, and raises good stock. It is in the south end of the fertile Clinch river valley, a beautiful and salubrious region.

This county is very rich in minerals, having abundance of iron ores, coal, copper, manganese, marble and limestone. It has many fine locations for mills and manufacturing establishments on the water courses, with ample power to run any amount of machinery. A railroad through this section would develop great re-

sources.\* There are many mineral springs in this county, both sulphur and chalybeate, and indications of salt water in several localities, producing a good percentage of salt.

In this county is found in great abundance a reddish, fossiliferous *mottled marble*, in which the colors are pleasingly blended with grayish white. The dun-colored and other varieties are also found of fine quality. A correspondent says there is mineral wealth enough in this county to pay the national debt.

#### SCOTT COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

The following were collected by Gen. Imboden.

1. *Coal*, from 6<sup>h</sup> to 7<sup>h</sup> bed, head of Stony creek.
2. *Fossil Iron Ore*, Clinton, from land of W. W. James, near head of Stony creek.
3. *Iron Ore*, brown hematite, from same locality as above.
4. *Tennessee Marble*, brown, block 16x11"x7 $\frac{1}{2}$ ", dressed, polished, &c.; from near Estillville, from land of Estillville Marble Company. Estillville is located on this marble, and with it the streets are Macadamized and the foundation walls of the houses are built.
5. *Dark Brown "Tennessee" Marble*, a polished block from "Bounds" tract of the Estillville Marble Company, four miles west from Estillville.
6. *Dappled Gray Marble*, a polished block, from land of same company, three miles southwest from Estillville.
7. *Cherry Spot Marble*, a dressed block, from same locality, &c., as above.
8. *Pebble Marble*, a polished block, from "Bounds" tract, same company. These specimens of marble are exceedingly beautiful; the quarries from which they came are very extensive, extending for miles along the track of the projected and now partially completed South Atlantic and Ohio railroad.

#### TAZEWELL

was formed in 1799 from Russell and Wythe. It is thirty-three miles long with varying width, and contains 372,247 acres of land, assessed at \$1,124,971; value of town lots, \$105,702. Population—white, 10,947; colored, 1,914; total, 12,861.

The surface is mountainous, but is relieved by fertile valleys, many of them of considerable extent. One of the largest of these valleys, called "Burke's Garden," is famed for its beauty and fertility. The soil is mostly limestone and very fertile, the mountains even to their tops being covered with a luxuriant growth of blue grass, which is indigenous here. The favorite and most profitable occupation here is grazing and fattening cattle, many of them being sent across the Atlantic to the markets of Great Britain.

The timber is abundant and of large dimensions. Oak, walnut, cherry, hickory, elm, chestnut and other trees attain to great size and altitude, and the most valuable timbers are used in the ordinary construction of dwellings.

Tazewell county is rich in minerals, having large deposits of the purest iron

\* Hitherto there has been no outlet for this mineral and forest wealth, no means of exploiting it; but now the South Atlantic and Ohio railroad is in course of construction from Bristol, Tenn., to Mineral city, 66 miles distant, tapping some of the richest coal and iron deposits in the United States. Along the whole line of this road is an immense quantity of the finest timber—walnut, wild cherry, poplar, ash, white oak and pine. The beautiful marble mentioned above is on the line of this road. This road is expected to reach Estillville, the county seat, by first January, 1887.

ores, coal, salt, gypsum, &c. Coal is being mined in great quantities and shipped by the New river branch of the Norfolk and Western railroad to Norfolk city for the coaling of ocean steamers, for which purpose it is well suited.

Pocahontas, close to which is located the principal mine, is a rapidly growing town of some 3,000 inhabitants, and is the present terminus of the New river division of the Norfolk and Western road. The great Flat Top mountain range, from which this coal is obtained, forms the northwestern border of this county, and is part of the dividing line between Virginia and West Virginia. The iron ores and other coal deposits will be developed by the contemplated extension of the branch road alluded to into the central parts of the county.

This county is watered by Clinch river flowing southwest and by tributaries of New river flowing northeast.

#### TAZEWELL COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

From Capt. C. R. Boyd.

1. *Red Shale Iron Ore*, fine quality, from Paint Lick mine.
1. *Semi-Bituminous Coal*, a complete section, 12' thick, from Pocahontas mine.
2. *Semi-Bituminous Coal*, samples from Pocahontas mine.
3. *Coke*, made at Pocahontas from above coal.

The following are from Virginia Department of Agriculture :

4. *Fossil*, in limestone.
5. *Iron*, smelted from Poor Valley ore in a common smith's forge; J. R. Witten.
6. *Limonite Iron Ore*, from Poor Valley—from Harvey Peets.
7. *Fossil Iron Ore*.
8. *Red Iron Ore*, magnetic.
9. *Limonite*, brown iron ore.
10. *Manganese*, ore.

#### WISE

was formed in 1855 from Lee, Scott and Russell counties. It has 311,391 acres of land, assessed at \$189,616, or sixty cents per acre. Population in 1880 was—white, 7,671; colored, 101; total, 7,772; but a part of this is to be credited to Dickenson county, a portion of which was taken from Wise since the last census.

Wise county lies on the Kentucky line, and is located amongst the lofty ranges of mountains which traverse this Trans-Appalachian country.

The soil, in some parts formed from limestone rocks, is of good quality and well adapted to grain and grass. Other sections, formed from disintegrated sandstone, have poorer soils, but the lands produce corn, vegetables and fruits and are well suited to the grape, and to pasture, especially of sheep.

The greater part of the area of Wise county is still covered with original forests of valuable timber, such as oak, chestnut, walnut, poplar, cherry, pine, &c. The cherry is notably abundant and of large size, and poplar trees of enormous size, some of them six and eight feet in diameter, with long, straight trunks seventy-five to eighty feet to the limbs.

The minerals of this county are iron ores, coal (bituminous, splint and cannel) in great abundance and easily mined. Lead and silver have also been found, but not yet in paying quantity. Limestone and valuable sandstone for building are abundant.

This county is watered by several considerable streams flowing into Russell's fork of Big Sandy river, and by Powell's river and other streams which flow south into Clinch river.

The great need of this section is access to market for its very valuable timber and minerals, which, it is hoped, will soon be supplied by the construction of the several railroads projected through this country.

A correspondent says:

"Had Wise county no other than her timber and mineral resources, she would be one of the most attractive counties in our State to the industrious and intelligent immigrant. At no distant day she is destined to become the theatre of immense mining and manufacturing operations, which will bring wealth to its thousands. All Wise lacks to make her one of the wealthiest counties in the State is railroad facilities, which she will very soon have. There is now being built a line of railroad from Bristol, Tenn., to Imboden city, in this county, and several other proposed lines have been surveyed through the centre of the county. A matter of time is the only prerequisite to the development of our natural resources and a public conveyance for our mineral and timber wealth.

"The free school system is well established in this county—every neighborhood has the advantage of from five to seven months' school each year. We also have one college, situated at Wise courthouse, with a good faculty, and with a daily attendance of from one hundred and fifty to two hundred pupils. This school is situated in a beautiful little town, where society is good, health good, board cheap—the very place for people of small means to acquire a good education."

#### WISE COUNTY MINERALS AT THE NEW ORLEANS EXPOSITION.

The following specimens were collected by Gen. John D. Imboden :

1. *Coking Coal*, a block 15" cube, from "Gibbs" opening in the "Imboden" bed, 8" thick, on Preacher Fork of Callaghan creek, on lands (72,000 acres) of the Virginia Coal and Iron Company.

2. *Coke*, made from above coal.

3. *Splint Coal*, from Shelving-rock bed, 4½" thick, from southeast face of Black mountain, from the property of the Virginia Coal and Iron Company.

4. *Splint Coal*, long block, from same bed as No. 3, the property of same company.

5. *Cannel Coal*, from upper bench, 26" thick, of 7" bed in Black mountain, property of same company.

## MINERAL WEALTH OF VIRGINIA.

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BY GEN. J. D. IMBODEN.

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It is very difficult, within the limits of a publication like this, to present with anything like detail a fair statement of the enormous mineral resources of the State. For all practical purposes, they are boundless in extent, and their distribution is such as to warrant the assertion that before the close of the present century the aggregate product of our mines will surpass in value those of any other State in the Union.

Between the Atlantic coast and the western boundaries of the State, the whole "geological column" is represented, from the foundation granite to the capstones of the upper carboniferous. And in these successive strata are found the rocks and minerals peculiar to each all over the world, and usually in greater abundance and of greater excellence than anywhere else within the same area.

It would require the space of a large volume to indicate all the localities where these "underground treasures" are now known to exist, and to describe their specific qualities and estimate their quantities. We must, therefore, be content with a few general statements.

### IRON ORES.

More than half the counties in the State contain mines of this invaluable mineral in ample quantities to give employment to thousands of men for ages yet to come.

The varieties in different localities are—

*Magnetites* (magnetic ore, so called because of its polarity, or mysterious power of attracting the magnetic needle).

*Limonites* (more commonly called brown hematite), and

*Specular*, or red hematite ore.

The *magnetites* abound in the Piedmont counties along the southeastern watershed of the Blue Ridge, in the James River valley, and in the high plateau counties of Floyd, Carroll and Grayson, drained by New river and tributaries. And in Smyth and Washington, and some others of the southwestern counties, a semi-magnetic ore is found of great excellence, but not usually stratified with the encasing rocks as the magnetites proper are generally found to be. All these ores are of peculiar value, inasmuch as they are, almost without exception, so low in phosphorus as to be adapted to the manufacture of Bessemer steel, that is so fast superseding iron in all structural work.

The *hematites*, both brown and red, have a much wider distribution. The brown exists in every county between the head of Tidewater and the western

boundaries of the State. They are most abundant west of the Blue Ridge, or rather on the western slopes of that range of mountains and in the hills, mountains and valleys beyond, all the way from the Potomac to the Tennessee line. The quantity of this class of ore throughout all that region is beyond all computation. And where the railroads from the coal regions cross or penetrate this vast field of ore supply, and bring in the needed fuel for their reduction, large modern furnaces are springing up, and give assurance that at an early day Virginia will rank amongst the foremost States in this great industry.

The red hematites and fossil ores are chiefly found in the southwestern counties, beyond the Alleghany, where it merges in the Blue Ridge, a few miles west of Salem, in Roanoke county. The existence of these valuable ores in close proximity to coal and the magnetites of East Tennessee and Western North Carolina are now attracting the most lively attention of Northern and foreign capitalists, with every indication that within less than ten years numerous short railroads will be built, as the necessary foundation for the inauguration of the business of Bessemer steel-making in that section of our State on a scale never before thought of in any part of the South.

#### COAL.

In the immediate vicinity of Richmond, lying on both sides of James river, the longest worked coal field in the United States exists. The coal is bituminous, and has long been esteemed as an excellent domestic fuel, and for foundry and blacksmith work and the generation of steam. Coal was shipped from this field to Philadelphia before the Pennsylvania mines were worked. The field is from ten to twelve miles wide and from thirty to forty in length, and in many places the seams are of enormous thickness. As a convenient supply to Richmond and towns and vessels on James river this coal is an important element of wealth in the State.

Smaller but similar mines exist near Farmville, but have never been extensively worked.

In Botetourt, Pulaski, Montgomery, and Wythe counties are somewhat extensive deposits of a semi-anthracite coal of local importance and value, furnishing a good domestic fuel. It is also used in the great zinc reduction works at Pulaski and at the salt works in Washington county.

In Rockingham and Augusta counties are some irregular seams of true anthracite, but their extent and commercial value have not been determined.

The great Virginia coal field lies in the counties of Tazewell, Russell, Buchanan, Dickenson, Wise, Lee and Scott. In these counties from eight hundred to one thousand square miles are underlaid with numerous seams of as pure and rich bituminous and cannel coal as have been found in the world. The bituminous coals proper cover the whole area mentioned—the splint more than two-thirds of it, and the cannel a much smaller and as yet undetermined area. These coals are in the Lower and Middle productive measures. At Pocahontas, in Tazewell, where the mines now yield about one million tons per annum, only the Lower measures are worked, where a coal similar to that on New river in West Virginia is found in much larger seams than in West Virginia. In Russell, Buchanan, Dickenson, Wise, Lee and Scott there are generally four, but in some places six seams of unsurpassed coal for all purposes, including coking coals that make a coke seven per cent. richer in carbon and freer from sulphur and ash than the celebrated Connellsburg coke of Pennsylvania, and four per cent. better than the Alabama coke that is so rapidly building up a vast iron production in that State.

Several railroads to and through this immense storage of the best of fuel for metallurgical purposes, for gas production, steam and domestic use, are projected. The companies are organized, and there is every indication that within the next ten years the development in that section of the State will surpass anything in its history. The best of the iron ores above mentioned are in close proximity to these coals; and the agricultural resources of that part of the State are adequate to the support of an immense industrial population.

#### ZINO.

At Pulaski, on the Norfolk and Western railroad in Southwestern Virginia, are located the largest zinc works in the South, with a supply of ore ascertained to be millions of tons. In numerous other localities in the same section of the State this valuable metal is found, and doubtless will lead to the erection of other works.

#### LEAD.

In Wythe county lead has been extensively mined for over one hundred years. At the present time the largest lead works in the South are carried on there, with apparently an exhaustless supply of ore. In the same section other mines of great value have been found, and measures are on foot to develope some of them. In Nelson county there is an old lead mine that seems only to have lacked capital to have become valuable.

#### COPPER.

In Carroll, Floyd and Grayson counties large veins of copper ores, sulphurets and carbonates exist, and prior to the war some of them were successfully worked. But their remoteness from railway lines has deterred capitalists from reestablishing these mining operations. There is some prospect that at an early day a railroad will penetrate that region, and lead to the reopening of these valuable mines.

In several of the Piedmont counties copper ores are known to exist, but the mines have never been operated, except in Loudoun, where much valuable ore has been raised and shipped to the North.

#### TIN.

In Rockbridge and Nelson counties tin has been found, with indications that the mines are extensive. The quality of the ore has been ascertained by analysis to be excellent, and it is expected from the partial openings made that the quantity will be sufficient to insure adequate capital for the full development of the mines.

#### MANGANESE.

This mineral is found widely disseminated in Virginia, in the form of the black oxide, and as manganiferous iron ore. The most productive manganese mine now worked in the United States is that of the Crimora Company in Augusta county, at the western base of the Blue Ridge near Waynesboro. Other deposits that are thought to be as large have recently been brought to light within a few miles of Crimora, between the Shenandoah Valley railroad and the Blue Ridge.

#### GOLD.

There is a well defined *belt* of gold-bearing quartz running across the State through the counties of Prince William, Stafford, Spottsylvania, Louisa, Fluvanna, Goochland, Buckingham, Prince Edward, Charlotte and Halifax. In many places

on this belt mines have been opened from time to time, and worked with profit and success. With the progress of scientific improvement in the extraction of gold, it may fairly be expected that gold mining in Virginia will become an extensive industry. This precious metal has also been found in Montgomery county. And in the Blue Ridge range of mountains in Roanoke and Patrick counties silver ores have recently been found that give promise of valuable results.

#### MICA AND PLUMBAGO.

In several of the counties near Richmond deposits of these minerals have been found, and to some extent worked with profit.

#### ASBESTOS AND STEATITE.

Asbestos of good quality and workable quantity exists in the counties lying between the upper James and the upper Dan rivers at several places, notably in Pittsylvania, Henry and Patrick. Steatite (soapstone) of fine quality for resisting the most intense heat is found in Amelia, Albemarle, and some other counties of Middle and Piedmont Virginia.

#### KAOLIN AND FIRE CLAYS.

These valuable substances have been found in large quantities in many of the Piedmont counties, and in Augusta county near the Blue Ridge. The latter deposit is extensively worked.

#### LIME AND CEMENT.

Metamorphic limestones exist in the valley of James river between Richmond and Lynchburg. Silurian limestone extends from the Potomac to Tennessee, in great variety. Since the discovery that building lime with a large percentage of the carbonate of magnesia is a poor material to use in the mortar of large buildings and other permanent works of masonry and brick, peculiar value attaches to beds of pure carbonate of lime. Such beds fortunately exist at convenient localities in the great Shenandoah Valley, and lime-burning is already carried on there at two points—Riverton in Warren county and Eagle Rock in Botetourt—where an article is produced entirely free from magnesia, and is in great demand for city work, where the sulphurous fumes of coal combustion are so destructive to magnesian-lime mortar. As this pure limestone exists in many places, the industry is a rapidly growing and profitable one.

Most excellent hydraulic cement has been produced for many years and in large quantity at Balcony Falls, in Rockbridge county. The stone is also found in Bedford near Biford's Gap, but has not been utilized.

#### PLASTER (GYPSUM).

On the waters of the North Fork of Holston river, in the counties of Smyth and Washington, there are many miles in length of an immense ledge of gypsum, as pure as that brought from Nova Scotia. It has been penetrated to the depth of nearly 600 feet and no bottom found. We have here a quantity of this valuable fertilizer that is practically exhaustless for centuries to come.

#### SALT.

In conjunction with the above-mentioned plaster bank, the celebrated wells of salt exist, that have been used for about a century at Saltville, in Washington

county, and during the late civil war supplied nearly the whole Confederacy east of the Mississippi with the indispensable article of salt of the greatest purity. No diminution in supply or quality has ever been detected. The production now is about half a million bushels annually.

#### MARL.

In many of the Tidewater counties enormous beds of blue and green sand marl and shells are found but a few feet below the surface, supplying a fertilizing material at a nominal cost that is rapidly converting all that region into the garden spot of the continent for supplying the great cities of the Atlantic coast with table vegetables of the highest excellence, and is giving such importance to the peanut culture.

#### SULPHURET OF IRON (PYRITES).

Immense mines of pyrites are worked in Louisa county and the products shipped north for the use of sulphuric acid manufactories. So important has this industry become that branch railroads have been run to the mines from the main line of the Newport News and Mississippi Valley railroad. Other large deposits exist in the mountain regions bordering on North Carolina, but needing a railroad for their development.

#### BARYTA.

Great quantities of this mineral have been shipped from the valley and south-western counties since the war.

#### BUILDING STONES.

Virginia probably stands first amongst the States in the variety and beauty of her building stones, beginning with her granites and slates in eastern Virginia and extending to her limestones in the west, her brownstones in several eastern counties, her marbles in Loudoun, Rockingham, Augusta, Rockbridge, Bedford, Russell and Scott counties, and ending with the beautiful sandstones of the south-western coalfield in half a dozen counties. This merely cursory glance at our mineral resources is all that we have space for. The cabinet of specimens being collected by the Department of Agriculture, at Richmond, will bear out and illustrate the text of this report in a most striking manner to the eye of any stranger who will call and examine it.

#### TIMBER RESOURCES OF VIRGINIA.

The *great* timber regions of the State are located at its opposite extremes. The Dismal Swamp forests have been "a mine of wealth" to their owners since the war. From Suffolk two narrow gauge roads have been built through these forests for the sole purpose of hauling out the lumber from numerous saw-mills. Pine and cypress predominate in that section. Nearly all the south side counties lying between the James river and North Carolina are productive of large quantities of excellent pine and white oak lumber. As we approach the Blue Ridge the pine gives place to the hard woods. The forests of Franklin, Henry and Patrick are valuable, even up to the summit of the mountains, and lumbermen have found their way in there, cutting black walnut, poplar, white oak, ash and hickory. All over eastern Virginia the black and red oaks grow, and have supplied, and for a long time will continue to furnish, large quantities of bark for tanning purposes. In the Shenandoah Valley, except along the slopes of its bordering mountains

there is no great quantity of lumber to be had; but in the mountains lying west of the valley there is a great deal of valuable hard wood timber still standing. But the timber region *par excellence* of the State is in the southwest. In the counties of Buchanan, Dickenson and Wise the forests are immense. The population is sparse, and the timber is so heavy that clearing the land is difficult. Hence the opened farms are far apart, and are, as a rule, mere patches in the wilderness of trees. Black walnut, poplar, chestnut, hickory, maple, ash, white oak, black oak, chestnut oak, beech, birch, sugar and red maples, and some hemlock in the dark hollows are the trees one meets with. Sometimes a spot of a few hundred acres is found covered with wild cherry. All the trees mentioned attain an enormous size in these forests. All the other counties of the southwest abound in the same kind of timber, but generally there has been much more clearing done, especially of the fertile grazing lands along the rivers and smaller water courses than in the three counties mentioned. Still their hills and mountains are clad with dense forests of nearly all the trees named. The southeastern end of Washington county, which extends to the summit of the great Iron mountain, contains 50,000 to 100,000 acres of white pine in its virgin state. At least half of this area is covered with trees of white pine of great size and value. A railroad through that section, either along the western base of the mountain or across the white pine belt from Grayson county through a gap in the mountain to Bristol-Goodson, Washington county, would open up this valuable forest to the lumberman.

It may be said in conclusion, under this head, that no State in the Union is better supplied with timber for its uses in all sections and with a very large surplus for export from many localities than Virginia. This fact is attracting widespread attention and is having no small influence in attracting population and capital to the State since the forests of the great northwest are approaching exhaustion.

## LIVE STOCK ON FARMS IN 1886.

*Taken from returns of Commissioner of the Revenue for 1886.*

COUNTIES.	Horses, Mules, Asses and Jennets.	Cattle.	Sheep.	Hogs.
Accomac.....	3,370	4,655	1,766	9,171
Albemarie.....	5,517	11,113	9,761	7,584
Alexandria.....	591	587	3	623
Alleghany.....	1,097	3,512	1,978	1,793
Amelia.....	1,403	3,215	1,832	2,601
Amherst.....	2,330	4,485	1,296	3,157
Appomattox.....	1,476	3,496	1,468	2,229
Augusta.....	8,502	22,296	11,502	12,883
Bath.....	1,292	3,141	4,677	2,059
Bedford.....	5,692	12,542	9,170	8,281
Bland.....	1,529	4,684	4,757	3,092
Botetourt.....	3,379	7,669	3,793	4,867
Brunswick.....	2,271	7,537	3,683	5,041
Buchanan.....	864	3,924	3,680	4,768
Buckingham.....	1,538	4,871	2,497	3,000
Campbell.....	2,987	5,899	4,312	4,580
Caroline.....	3,012	5,052	2,136	4,262
Carroll.....	1,785	8,626	7,119	6,141
Charles City.....	923	1,669	1,441	2,271
Charlotte.....	2,250	5,110	3,377	4,175
Chesterfield.....	2,253	3,550	3,322	3,972
Clarke.....	2,885	6,026	7,740	5,579
Craig.....	1,249	3,783	3,238	2,017
Culpeper.....	3,390	9,697	10,327	5,716
Cumberland.....	1,502	3,282	3,021	3,256
Dickenson.....	717	3,123	3,539	3,471
Dinwiddie.....	1,817	4,312	1,988	4,672
Elizabeth City.....	886	1,216	1,063	1,821
Essex.....	1,536	4,111	2,652	3,469
Fairfax.....	3,662	7,602	2,786	4,555
Fauquier.....	6,089	23,278	10,800	10,499
Floyd.....	2,372	8,629	6,456	5,010
Fluvanna.....	1,573	3,601	1,806	2,062
Franklin.....	4,088	10,111	5,526	6,683
Frederick.....	4,710	9,473	8,835	4,139

## LIVE STOCK ON FARMS IN 1886—CONTINUED.

COUNTIES.	Horses, Mules, Asses and Jennets.	Cattle.	Sheep.	Hogs.
Giles.....	2,094	5,963	5,066	4,671
Gloucester.....	1,753	4,713	2,692	3,815
Goochland.....	1,522	2,925	2,144	2,341
Grayson.....	2,793	8,804	8,524	4,688
Greene .....	1,233	2,371	1,467	2,904
Greensville.....	1,105	2,770	933	4,165
Halifax.....	4,843	7,811	3,240	9,187
Hanover.....	2,094	4,673	2,495	5,399
Henrico.....	2,290	3,960	950	2,818
Henry.....	2,199	4,533	1,935	4,632
Highland .....	1,873	8,077	9,007	2,381
Isle of Wight.....	2,145	3,391	946	9,865
James City.....	596	1,702	863	1,856
King & Queen.....	1,604	4,906	2,533	2,668
King George.....	1,546	2,829	1,887	1,538
King William.....	1,549	2,766	1,795	2,277
Lancaster.....	1,014	2,310	1,023	2,579
Lee .....	3,813	9,511	6,042	11,092
Loudoun.....	8,043	21,495	14,402	11,577
Louisa.....	2,469	5,860	3,696	4,066
Lunenburg.....	1,746	4,803	2,456	4,249
Madison.....	2,423	6,725	4,162	6,127
Mathews.....	873	2,106	966	1,769
Mecklenburg.....	3,263	8,799	4,994	8,352
Middlesex.....	955	1,902	1,177	2,087
Montgomery.....	2,551	7,400	4,160	5,043
Nansemond.....	2,478	3,555	683	11,393
Nelson.....	2,640	5,456	3,826	5,271
New Kent.....	1,037	1,807	921	2,534
Northampton.....	2,917	1,903	494	3,177
Northumberland.....	334	273	20	1,001
Nottoway.....	1,817	3,689	1,848	3,415
Orange .....	1,209	3,823	1,522	3,024
Page.....	2,843	7,064	8,369	6,518
Patrick .....	2,403	5,302	2,260	5,660
Pittsylvania.....	1,604	5,291	3,356	5,058
	5,962	9,231	3,405	9,107

## LIVE STOCK ON FARMS IN 1886—CONTINUED.

COUNTIES.	Horses, Mules, Asses and Jennets.	Cattle.	Sheep.	Hogs.
Powhatan.....	1,438	1,869	3,095	3,486
Prince Edward .....	1,467	3,428	1,427	3,603
Prince George.....	1,401	1,247	1,435	2,644
Princess Anne.....	2,252	4,083	2,867	7,186
Prince William.....	2,563	6,598	5,280	4,509
Pulaski.....	1,853	7,316	4,121	4,482
Rappahannock.....	1,183	9,714	7,180	4,694
Richmond .....	958	3,587	1,451	3,736
Roanoke.....	2,293	5,239	2,059	3,112
Rockbridge.....	4,922	12,300	6,101	6,623
Rockingham.....	8,133	19,837	5,969	13,508
Russell.....	3,944	13,927	6,653	5,080
Scott.....	4,542	10,827	9,424	12,969
Shenandoah.....	4,775	11,678	5,460	8,967
Smyth.....	2,725	7,975	7,033	4,825
Southampton.....	2,892	5,221	1,510	13,882
Spotsylvania.....	1,947	4,477	2,732	2,994
Stafford.....	1,661	3,984	2,270	3,004
Surry.....	1,308	1,880	691	5,150
Sussex.....	963	1,183	339	1,559
Tazewell.....	3,143	12,751	7,930	6,345
Warren.....	1,962	4,525	3,891	2,751
Warwick .....	364	734	357	506
Washington.....	4,498	10,189	6,434	6,188
Westmoreland.....	1,226	4,715	2,245	3,783
Wise.....	1,335	4,369	4,841	5,707
Wythe.....	3,197	10,207	7,401	5,691
York .....	768	2,076	436	1,493
Total.....	242,108	601,234	378,233	498,263

A BRIEF SUMMARY  
OF THE  
History of Public Free Schools in Virginia  
AND THE MEANS OF ACQUIRING  
A FREE HIGHER EDUCATION,

*Prepared by the Superintendent of Public Instruction, at the request of Colonel Randolph Harrison, Commissioner of Agriculture of Virginia, for his Hand-Book of Virginia.\**

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The public free school system of Virginia is rooted in the organic law of the State. Article VIII of the constitution outlines definitely and distinctly the essential features of the whole system. As this article embraces, with slight exception, all the provisions of the constitution relating to public education, it is quoted in full.

#### ARTICLE VIII—EDUCATION.

SEC. 1. The general assembly shall elect, in joint ballot, within thirty days after its organization, under this constitution, and every fourth year thereafter, a superintendent of public instruction. He shall have the general supervision of the public free school interest of the State, and shall report to the general assembly for its consideration, within thirty days after his election, a plan for a uniform system of public free schools.

SEC. 2. There shall be a board of education, composed of the governor, superintendent of public instruction and attorney-general, which shall appoint and have power to remove, for cause and upon notice to the incumbents, subject to confirmation by the senate, all county superintendents of public free schools. This board shall have, regulated by law, the management and investment of all school funds, and such supervision of schools of higher grades as the law shall provide.

SEC. 3. The general assembly shall provide by law, at its first session under this constitution, a uniform system of public free schools, and for its gradual, equal and full introduction into all the counties of the State, by the year 1876, or as much earlier as practicable.

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\* This paper was originally prepared by my predecessor, Hon. R. R. Farr, at the request of the Commissioner of Agriculture, and published in a former edition of the Hand-Book of Virginia. In compliance with a similar request, the paper has been revised, such changes and additions having been made as were necessary to bring it up to the date of this edition of the Hand-Book.—

SEC. 4. The general assembly shall have power, after a full introduction of the public free school system, to make such laws as shall not permit parents and guardians to allow their children to grow up in ignorance and vagrancy.

SEC. 5. The general assembly shall establish, as soon as practicable, normal schools, and may establish agricultural schools and such grades of schools as shall be for the public good.

SEC. 6. The board of education shall provide for uniformity of text-books and the furnishing of school-houses with such apparatus and library as may be necessary, under such regulations as may be provided by law.

SEC. 7. The general assembly shall set apart, as a permanent and perpetual literary fund, the present literary funds of the State, the proceeds of all public lands donated by congress for public school purposes, of all escheated property, of all waste and unappropriated lands, of all property accruing to the State by forfeiture, and all fines collected for offences committed against the State, and such other sums as the general assembly may appropriate.

SEC. 8. The general assembly shall apply the annual interest on the literary fund, the capitation tax provided for by this constitution for public free school purposes, and an annual tax upon the property of the State of not less than one mill nor more than five mills on the dollar, for the equal benefit of all the people of the State, the number of children between the ages of five and twenty-one years, in each public free school district, being the basis of such division. Provisions shall be made to supply children attending the public free schools with necessary text-books in cases where the parent or guardian is unable, by reason of poverty, to furnish them. Each county and public free school district may raise additional sums by a tax on property for the support of the public free schools. All unexpended sums of any one year in any public free school district shall go into the general school fund for redvision the next year: provided, that any tax authorized by this section to be raised by counties or school districts shall not exceed five mills on a dollar in any one year, and shall not be subject to a redvision, as hereinbefore provided in this section.

SEC. 9. The general assembly shall have power to foster all higher grades of schools under its supervision, and to provide for such purpose a permanent educational fund.

SEC. 10. All grants and donations received by the general assembly for educational purposes shall be applied according to the terms prescribed by the donors.

SEC. 11. Each city and county shall be held accountable for the destruction of school property that may take place within its limits by incendiaries or open violence.

SEC. 12. The general assembly shall fix the salaries and prescribe the duties of all school officers, and shall make all needful laws and regulations to carry into effect the public free school system provided for by this article.

At the time the constitution was ratified, July 6, 1869, members for a general assembly were elected, which met the 5th of the following October. Among its first acts was the passage of a law providing for a uniform system of public free schools for the counties. This law was approved July 11th, 1870, (the law providing for a system of public free schools in the cities of the Commonwealth was not passed until the following session, and was approved March 31st, 1871).

The laws enacted to carry into effect the provisions of the constitution in relation to public free schools were full and explicit. The schools were made free to all children of the Commonwealth between the ages of five and twenty-one. It was provided that the district school trustees required by section 3 of article 7 of

the constitution should be elected and controlled under said section by the board of education. This was amended January 11th, 1877, so as to create a "trustee electoral board," to be composed of the county superintendent of schools, county judge and attorney for the commonwealth, and this was superseded in February, 1884, by the law which creates in each county in the State a board known as the "County Board of School Commissioners," to consist of "three citizens of each county in the Commonwealth," to be elected by the general assembly every four years, and "to go into office the first day of April succeeding their election, after having taken and subscribed the usual oath of office." This board is clothed with all the powers and duties of its predecessor.

Whilst there is nothing in the constitution of the State which prohibits white and colored children from being taught in the same schools, the original law, which gave force to the constitution, provides that "white and colored children shall not be taught in the same school, but in separate schools, under the same general regulations as to management, usefulness and efficiency." This provision was emphasized by the law being reenacted the 27th of June, 1877, and again the 26th of January, 1882.

In brief, the public free school system of Virginia is administered by the following boards and officers :

#### STATE BOARD OF EDUCATION.

The State Board of Education, consisting of the governor, who is *ex-officio* chairman, the attorney-general, and superintendent of public instruction. At this time it is composed of His Excellency Fitzhugh Lee, governor; Hon. R. A. Ayres, attorney-general, and John L. Buchanan, superintendent of public instruction.

#### SUPERINTENDENT OF PUBLIC INSTRUCTION.

The superintendent of public instruction is elected by the joint vote of the general assembly, and holds his office for four years from the 15th day of March following his election. He is "the chief executive of the public free school system," and is charged with the duty of seeing that all laws and regulations are faithfully executed, and of determining the true intent and meaning of same. His duties are numerous and responsible. He is provided with an office and two clerks, and is allowed a salary of two thousand dollars per annum, and is required to make an annual report to the Board of Education of "his official proceedings for the year ending the 31st day of July preceding."

#### COUNTY AND CITY SUPERINTENDENTS OF SCHOOLS.

Every county and city in the State—and some of the towns—has a superintendent of schools, who is appointed by the Board of Education for a term of four years from the first of July following the appointment, "subject to confirmation by the Senate." Their salaries are fixed according to the population of their respective counties and cities, and paid in quarterly instalments out of the State school fund. They receive thirty dollars for each thousand of population under their respective jurisdictions for the first ten thousand, rejecting fractions less than five hundred, and twenty dollars for each one thousand in excess of ten thousand up to and including thirty thousand, rejecting fractions of five hundred, and so on.

Superintendents of schools have a general supervision over all the schools in

their respective counties, cities and towns, and are required to do all in their power to promote the efficiency of the same. They examine and license all teachers, apportion the State and county school money among the several school districts, and exercise a general supervision over the finances of the schools. All teachers of the county or city report to the superintendent monthly and at the end of their term; and it is his receipt for monthly reports that entitles them to the warrants of the board of trustees, upon which they draw their salaries. Every superintendent is required to report to the superintendent of public instruction monthly and annually, and to observe such instructions and regulations as he may from time to time prescribe.

#### SCHOOL DISTRICTS.

The law provides that each school district shall correspond in boundaries with the magisterial districts (except when modified in the creation of sub-districts); "that each district shall be a body corporate; that it may sue and be sued, contract and be contracted with; take, hold and convey property."

There are 450 districts in the counties of the State, and ten city school boards, composed of all the trustees of the respective cities or towns, who are appointed by the councils of the same. Each city board constitutes a single corporation, with the same officers, powers and duties of ordinary boards of district school trustees.

#### TRUSTEES.

There are three trustees for each school district, one of them being appointed annually by the board of school commissioners. There are 1,350 trustees for the districts in the counties, and 102 for the wards in the cities, giving a total of 1,452 for the State. With the exception of the member who acts as clerk of the district board—who may be allowed for his services out of the district fund not exceeding two dollars for every day of service rendered within prescribed limits—the members serve without compensation.

#### TEACHERS.

All persons who desire to teach in the public schools are required to be examined by and obtain from the superintendent of the county or city, where they intend to teach, a written certificate of qualification. They are elected by the boards of trustees of the respective districts, and are required by law to enter into a written contract to faithfully discharge their duties.

During the school year ending the 31st day of July, 1884, there were employed in the State 2,362 white male teachers, 2,421 white female teachers; 885 colored male teachers, and 703 colored female teachers—making a total of 6,371 employed. The average salary per month paid teachers for year ending July 31st, 1884, was: White males, \$30.25; females, \$26.18. Colored males, \$25.77; colored females, \$23.52.

#### BRANCHES TAUGHT.

In every public free school shall be taught orthography, reading, writing, arithmetic, grammar, and geography, and by common consent history, and no other branches unless the county school board has determined to introduce the higher branches; then the boards of trustees of the districts in such counties, with the consent of said board in each case, can introduce the higher branches in

their respective schools, provided that the introduction of said branches does not conflict or interfere with efficient instruction in the elementary English branches. District boards are required to furnish text-books free to children whose parents or guardian are unable to provide them.

#### TEXT-BOOKS.

A list of text-books is prescribed by the Board of Education, from which the county boards adopt such books as they may think proper.

The contracts are made with the publishing houses for four years, and no book not found on the State list can be used in any of the public free schools, nor can any book, when adopted, be changed for any other on the same subject until the expiration of the four years.

#### COUNTY SCHOOL BOARDS.

In each county there is a county school board, composed of the county superintendent, who is *ex-officio* its chairman, and the district trustees of all the districts in the county. This board recommends to the board of supervisors the amount of money necessary for the county and district school fund for the ensuing year. It is also charged with the duty of seeing that the treasurer's accounts and the accounts of the district clerks are correct, and of instituting suits against all defaulters.

#### SCHOOL TAXES

consists of three classes. First, the amount received from the State under the requirements of the constitution, and this now is also divided into two classes—viz: the gross amount received annually, which, under the requirements of the act approved March 6th, 1883, is left in the hands of the respective treasurers and disbursed on the order of the superintendent of schools. Second, all cash received on account of balances due on the annual revenue, on the final settlement of the account, the quarterly payment required by the act referred to, to be paid on the arrearage account, and the interest on the literary fund. These amounts are all paid into the hands of the Second Auditor, to the credit of the State Board of Education, and are disbursed in accordance with the requirements of law for the support of public free schools upon the order of said board.

The county school tax is levied by the boards of supervisors, upon the recommendation of the county school board. It is a general tax upon the people of the county, and when collected is apportioned to the respective districts upon the basis of school population, as State money is apportioned, and can be used only for the pay of teachers.

The district tax is levied upon the property of the respective districts, and is used exclusively in the district where it is collected for building, repairing and furnishing school-houses, providing school furniture and apparatus, supplying indigent children with text-books, and to pay contingent expenses.

#### THE FIRST PUBLIC FREE SCHOOLS

under the present system were opened about the middle of November, 1870. The most of the school-houses and appliances were provided by private means, the machinery of levying and collecting the district tax, as it now exists, not having been authorized.

## STATE INSTITUTIONS FOR HIGHER EDUCATION.

In addition to the instruction in the higher branches, which is given in many of the public free schools of the counties, the public high schools of the principal cities, such as Richmond—where public free school facilities rank first in the State, and which will compare favorably with those of any other city of equal extent in the United States—Petersburg, Norfolk, Alexandria, Lynchburg, Staunton and most of the towns, such as Fredericksburg, Harrisonburg, Abingdon, and so on, furnish ample facilities for acquiring a first-class education.

Besides these means of obtaining a free education, all of the young men in the State over 18 years of age, under restrictions in regard to proficiency, are allowed to enter the academic department of the University of Virginia free of tuition, thus affording a rare opportunity to secure the highest education. The University is situated at Charlottesville, Albemarle county, and was established in 1825.

The Virginia Military Institute is situated at Lexington, Va., in the county of Rockbridge, and was established in 1839.

The Virginia Agricultural and Mechanical college is situated at Blacksburg, in Montgomery county, Va., and was opened in 1872.

These institutions are supported in part by the State, and are free for a selected number of male students of proper age and acquirements.

The Virginia Normal School, at Farmville, was opened in 1884, and is exclusively for the education of teachers. It is supported by the State, and is open only to young ladies under certain restrictions as to qualification and location.

The Hampton Normal and Agricultural Institute, established at Hampton in 1868, is for colored youths of both sexes, and receives some assistance from the State.

The Virginia Normal and Collegiate Institute is situated in the county of Chesterfield, opposite the city of Petersburg. It was incorporated in 1882, and the normal department opened in October, 1883. It is exclusively for the education of the negroes of Virginia of both sexes, and is managed by a board of trustees, all of whom are negroes but two, and the act of its corporation requires that the president and all the instructors and attachés shall be of that race.

In addition to these institutions provision is made by the State for the education of the mute and blind in an institution at Staunton.

From this brief summary it will be seen that Virginia is alive to the great importance of education, and has afforded her children ample opportunities to obtain not only a well grounded primary education, through the means of a thorough public free school system, but unusual facilities for the higher education *free* in the institutions enumerated.

A careful examination of the following tables will show that the people are alive to their interest, and that never in the history of the State were they so thoroughly awakened to the importance of education as at the present time.

## COUNTY AND CITY SUPERINTENDENTS OF SCHOOLS.

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*Term ends June 30th, 1889.*

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COUNTY OR CITY.	SUPERINTENDENT.	POST-OFFICE.
Accomac .....	John E. Mapp .....	Keller.
Albemarle.....	D. P. Powers.....	Scottsville.
Alexandria city.....	R. L. Carne .....	Alexandria.
Alexandria county.....	John E. Febrey.....	Falls Church, Fairfax Co.
Alleghany .....	George B. McCorkle .....	Covington.
Amelia .....	J. L. T. Holland.....	Amelia C. H.
Amherst.....	A. J. Richeson .....	Pedlar Mills.
Appomattox.....	C. H. Chilton .....	Spout Spring.
Augusta .....	C. T. Jordan .....	Staunton.
Bath .....	George W. Simpson .....	Bath Alum.
Bedford.....	N. D. Hawkins .....	Coffee.
Bland .....	Davis H. Munsey .....	Kimberling.
Botetourt .....	Cary Breckinridge .....	Fincastle.
Brunswick .....	George R. Blick .....	Smoky Ordinary.
Buchanan.....	Sparrell Ratliff .....	Grundy.
Buckingham .....	W. P. Ellis .....	Moseley.
Campbell.....	Robert C. Saunders .....	Evington.
Caroline.....	A. G. Smith .....	Croxtons.
Carroll.....	W. H. Mitchell .....	Hillsville.
Charles City.....	John E. Graves .....	Wilcox Wharf.
Charlotte.....	H. J. Watkins .....	Mossing Ford.
Chesterfield .....	W. A. Blankingship .....	Matoca.
Clarke .....	W. F. Meade .....	White Post.
Craig .....	Crockett B. Givens .....	Simmonsville.
Culpeper .....	Warren E. Coons .....	Ryland.
Cumberland .....	William C. Corson .....	McRae's.
Danville .....	Eston Randolph .....	Danville.
Dickenson .....	I. E. French .....	Clintwood.
Dinwiddie .....	Eugene C. Powell .....	San Marino.
Elizabeth City.....	John M. Willis .....	Hampton.
Essex.....	Edward R. Baird .....	Occupacia.
Fairfax .....	M. D. Hall .....	Fairfax C. H.
Fauquier .....	William C. Marshall .....	Warrenton.
Floyd.....	G. A. Willis .....	Hylton.

COUNTY OR CITY.	SUPERINTENDENT.	POST-OFFICE.
Fluvanna.....	James O. Shepherd.....	Palmyra.
Franklin.....	W. E. Duncan.....	Hale's Ford.
Frederick.....	Maurice M. Lynch.....	Winchester.
Fredericksburg.....	J. G. Swartz.....	Fredericksburg.
Giles.....	D. F. Hale.....	Narrows.
Gloucester.....	William F. Hogg.....	Hayes' Store.
Goochland.....	H. D. Ragland.....	Hadensville.
Grayson.....	W. S. Hale.....	Elk Creek.
Greene.....	George B. Jennings.....	Ruckersville.
Greenville.....	W. N. Bell.....	Hicksford.
Halifax.....	Thomas E. Barksdale.....	Whitlock.
Hanover.....	W. H. Campbell.....	Oliver.
Henrico.....	John K. Fussell.....	Richmond.
Henry.....	Wythe M. Peyton.....	Martinsville.
Highland.....	O. P. Chew.....	Crabbottom.
Isle of Wight.....	Gavin Rawls.....	Carrsville.
James City.....	James H. Allen.....	Toano.
King & Queen.....	John Temple.....	Walkerton.
King George.....	R. Walter Coakley.....	Edge Hill.
King William.....	William V. Croxton.....	Manquin.
Lancaster.....	Frank W. Lewis.....	Litwalton.
Lee.....	A. M. Goins.....	Jonesville.
Loudoun.....	L. M. Shumate.....	Leesburg.
Louisa.....	Frank T. West.....	Trevilians.
Lunenburg.....	George W. Hardy.....	Opie, Prince Edward Co.
Lynchburg.....	E. C. Glass.....	Lynchburg.
Madison.....	James W. Banks.....	Wolftown.
Manchester.....	H. A. Maurice.....	Manchester.
Mathews.....	Thomas B. Lane.....	Port Haywood.
Mecklenburg.....	Thomas W. Smith.....	Hanford.
Middlesex.....	R. T. Bland.....	Saluda.
Montgomery.....	R. B. Richardson.....	Shawsville.
Nansemond.....	Lee Britt.....	Suffolk.
Nelson.....	George E. Caskie.....	Lovingston.
New Kent.....	Oliver F. Taylor.....	Oak.
Norfolk city.....	James Barron Hópe.....	Norfolk.
Norfolk county.....	John T. West.....	Cornland.
Northampton.....	George R. Mapp.....	Machipongo.
Northumberland.....	Giles F. Eubank.....	Village.
Nottoway.....	T. W. Sydnor.....	Blackstone.
Orange.....	William C. Williams.....	Orange C. H.
Page.....	H. M. Keyser.....	Honeyville.
Patrick.....	Abram Staples.....	Stuart.
Petersburg.....	D. M. Brown.....	Petersburg.
Pittsylvania.....	Lysander H. Pigg.....	Chatham.
Portsmouth.....	John C. Ashton.....	Portsmouth.
Powhatan.....	Carter H. Harrison.....	Vinitaville, Goochland Co.
Prince Edward.....	L. C. Irving.....	Farmville.
Prince George.....	J. W. Stephenson.....	Garysville.
Princess Anne.....	O. B. Mears.....	Kempsville.

COUNTY OR CITY.	SUPERINTENDENT.	POST-OFFICE.
Prince William.....	A. P. Gray.....	Haymarket.
Pulaski.....	A. H. Jordan.....	Dublin.
Rappahannock.....	H. M. Miller.....	Washington.
Richmond city.....	John B. Cary.....	Richmond.
Richmond county.....	Robert Hall.....	Warsaw.
Roanoke city.....	William Lunsford.....	Roanoke.
Roanoke county.....	William M. Graybill.....	Roanoke.
Rockbridge.....	J. Sidney Saville.....	Lexington.
Rockingham.....	George H. Hulvey.....	Bridgewater.
Russell.....	Davis C. Alderson.....	Hawkins' Mills.
Scott.....	W. D. Smith.....	Estillville.
Shenandoah .....	Joseph B. McInturff.....	Strasburg.
Smyth.....	A. G. Pendleton.....	Marion.
Southampton.....	James F. Bryant.....	Franklin.
Spotsylvania.....	Chancellor Bailey.....	Fredericksburg.
Stafford.....	G. M. Weeden.....	Bellefair Mills.
Staunton.....	W. W. Robertson.....	Staunton.
Surry .....	William Dillard.....	Claremont.
Sussex.....	R. K. Harrison.....	Stony Creek.
Tazewell .....	H. M. Smythe.....	Pocahontas.
Warren .....	Gibson E. Roy.....	Front Royal.
Warwick .....	J. H. Crafford.....	Lee Hall.
Washington .....	R. P. Carson.....	Abingdon.
Westmoreland .....	T. Hunter, Jr.....	Maple Grove.
Williamsburg.....	W. C. Constable.....	Williamsburg.
Wise.....	J. B. Gilly.....	Big Stone Gap.
Wythe.....	George R. Huffard.....	Wytheville.
York.....	William H. Sheild.....	Yorktown.

*Number of Schools, Enrolment and Average Daily Attendance of Pupils  
for the Scholastic Year ending July 31, 1885.*

COUNTIES AND CITIES.	SCHOOLS.			ENROLMENT.			AVERAGE DAILY ATTENDANCE.		
	White.	Colored.	TOTAL.	White.	Colored.	TOTAL.	White.	Colored.	TOTAL.
Accomac.....	64	18	82	3,511	1,677	5,188	1,975	700	2,675
Albemarle.....	77	47	124	2,768	2,460	5,228	1,667	1,502	3,169
Alexandria city.....	17	14	1	917	762	1,679	683	562	1,245
Alexandria county.....	4	5	9	241	421	662	136	212	348
Alleghany.....	36	7	43	1,268	298	1,566	780	170	950
Amelia.....	20	15	35	694	910	1,604	397	437	348
Amherst.....	57	26	83	2,255	1,422	3,677	1,384	853	2,237
Appomattox.....	27	17	44	1,062	941	2,003	612	489	1,101
Augusta.....	162	44	206	5,440	1,782	7,222	2,763	1,271	4,034
Bath.....	26	4	30	768	159	927	597	114	711
Bedford.....	100	42	142	4,513	2,311	6,824	2,558	1,361	3,919
Bland.....	38	3	41	1,444	73	1,517	841	48	889
Botetourt.....	68	23	91	2,341	915	3,256	1,470	644	2,114
Brunswick.....	33	34	67	1,175	2,259	3,434	663	996	1,659
Buchanan.....	39	.....	39	1,074	.....	1,074	636	.....	636
Buckingham.....	46	35	81	1,285	1,618	2,903	744	885	1,629
Campbell.....	49	30	79	2,317	3,010	5,327	1,463	1,016	2,484
Caroline.....	35	31	66	1,133	1,832	2,965	634	890	1,574
Carroll.....	81	3	84	4,004	83	4,087	2,047	53	2,100
Charles City.....	8	8	16	260	443	703	148	216	364
Charlotte.....	30	28	58	1,611	1,932	3,543	806	1,219	2,025
Chesterfield.....	42	26	68	1,608	1,252	2,860	983	608	1,591
Clarke.....	22	11	33	922	489	1,411	484	326	810
Craig.....	33	.....	33	1,083	.....	1,083	788	.....	788
Culpeper.....	37	23	60	1,319	1,209	2,528	799	709	1,508
Cumberland.....	23	21	44	712	1,134	1,846	467	561	1,028
Danville.....	13	11	24	536	751	1,287	319	341	660
Danville Dist.....	45	25	70	1,754	1,944	3,698	1,080	900	1,980
Dickenson.....	25	.....	25	1,021	.....	1,021	562	.....	562
Dinwiddie.....	34	29	63	1,077	1,522	2,599	583	711	1,294
Elizabeth City.....	12	17	29	673	1,279	1,952	358	891	1,249
Essex.....	20	20	40	668	1,212	1,880	367	700	1,067
Fairfax.....	52	22	74	2,452	1,131	3,583	1,385	657	2,042
Fauquier.....	61	32	93	2,539	1,648	4,187	1,350	888	2,238

## NUMBER OF SCHOOLS, ENROLMENT, ETC.—CONTINUED.

COUNTIES AND CITIES.	SCHOOLS.			ENROLMENT.			AVERAGE DAILY ATTENDANCE.		
	White.	Colored.	TOTAL.	White.	Colored.	TOTAL.	White.	Colored.	TOTAL.
							7	8	
Floyd.....	80	8	88	3,641	325	3,966	2,036	212	2,248
Fluvanna.....	33	20	53	1,094	1,038	2,132	681	492	1,173
Franklin.....	89	30	119	3,824	1,477	5,301	1,938	891	2,829
Frederick.....	76	5	81	2,982	139	3,121	1,808	107	1,915
Fredericksburg.....	8	4	12	475	330	805	401	249	650
Giles.....	55	5	60	2,695	134	2,819	1,612	87	1,699
Gloucester.....	20	23	43	840	1,534	2,374	432	849	1,281
Goochland .....	22	23	45	801	1,216	2,017	470	622	1,092
Grayson.....	68	6	74	3,486	253	3,739	1,903	142	2,045
Greene.....	22	6	28	761	310	1,071	464	185	649
Greenville.....	18	19	37	455	787	1,242	302	509	811
Halifax.....	75	40	115	2,882	2,722	5,604	1,497	1,461	2,958
Hanover.....	45	27	72	1,591	1,679	3,270	790	730	1,520
Henrico.....	39	26	65	1,511	1,574	3,085	941	1,045	1,989
Henry.....	46	25	71	1,534	1,173	2,707	763	631	1,394
Highland.....	41	2	43	1,357	66	1,423	868	42	910
Isle of Wight.....	39	17	56	1,350	710	2,060	840	440	1,280
James City.....	9	8	17	244	371	615	138	194	332
King & Queen.....	21	16	37	796	913	1,709	421	440	861
King George .....	17	11	28	515	828	1,343	258	289	547
King William.....	18	17	35	661	1,004	1,665	401	563	964
Lancaster.....	10	9	19	374	606	980	199	207	406
Lee.....	88	8	96	5,400	300	5,700	4,500	220	4,720
Loudoun .....	79	27	106	3,477	1,629	5,106	2,020	887	2,907
Louisa.....	44	36	80	1,425	2,029	3,454	786	1,002	1,788
Lnnenburg.....	28	24	52	979	1,304	2,283	591	729	1,320
Lynchburg .....	26	18	44	1,355	1,155	2,510	977	844	1,821
Madison.....	41	19	59	1,382	938	2,320	843	553	1,396
Manchester.....	7	4	11	465	375	840	332	182	514
Mathews.....	19	9	28	860	365	1,225	640	300	940
Mecklenburg.....	46	39	85	1,805	2,732	4,537	965	1,395	2,360
Middlesex.....	12	10	22	463	751	1,214	229	325	554
Montgomery .....	71	21	92	1,900	500	2,400	1,323	399	1,712
Nansemond.....	33	21	54	1,207	1,290	2,497	717	690	1,407
Nelson .....	58	25	83	1,920	1,217	3,137	1,168	741	1,909

## NUMBER OF SCHOOLS, ENROLMENT, ETC.—CONTINUED.

COUNTIES AND CITIES.	SCHOOLS.			ENROLMENT.			AVERAGE DAILY ATTENDANCE.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
	1	2	3	4	5	6	7	8	9
New Kent.....	12	9	21	323	470	793	200	255	455
Norfolk city.....	18	12	30	1,244	778	2,022	719	551	1,270
Norfolk county.....	30	33	63	1,434	2,597	4,031	800	1,178	1,978
Northampton.....	16	10	26	680	721	1,441	344	339	733
Northumberland.....	21	11	32	895	640	1,535	457	323	780
Nottoway.....	23	16	39	660	930	1,590	420	654	1,074
Orange.....	37	22	59	1,246	1,193	2,439	629	635	1,314
Page .....	62	7	69	2,641	293	2,934	1,649	195	1,844
Patrick.....	63	12	75	3,018	514	3,532	1,404	291	1,695
Petersburg .....	20	21	41	1,259	1,686	2,945	867	1,190	2,057
Pittsylvania .....	68	34	102	3,237	1,943	5,180	1,650	1,093	2,743
Portsmouth.....	12	5	17	805	469	1,274	574	295	869
Powhatan.....	17	15	32	538	859	1,397	330	464	794
Prince Edward.....	29	29	58	921	1,844	2,765	572	1,014	1,586
Prince George.....	18	17	35	625	1,048	1,673	332	436	818
Prince William.....	34	11	45	1,417	670	2,087	771	292	1,063
Princess Anne.....	20	11	31	1,001	767	1,768	556	394	950
Pulaski.....	29	10	39	1,266	520	1,786	837	327	1,164
Rappahannock.....	30	13	43	1,269	615	1,884	679	331	1,010
Richmond city.....	102	60	162	5,113	3,172	8,285	4,238	2,760	6,998
Richmond county.....	16	10	26	783	538	1,321	353	256	639
Roanoke county.....	56	20	76	2,261	1,161	3,422	1,399	662	2,061
Rockbridge.....	95	27	102	3,760	1,206	4,966	2,246	738	2,984
Rockingham .....	191	16	207	7,417	756	8,173	5,038	480	5,518
Russell.....	76	5	81	3,420	166	3,586	1,940	119	2,059
Scott.....	94	5	99	5,296	146	5,442	2,963	117	3,080
Shenandoah.....	105	4	109	4,815	173	4,988	2,820	106	2,926
Smyth.....	57	9	66	2,806	329	3,135	1,591	201	1,792
Southampton.....	40	31	71	1,318	1,956	3,274	806	866	1,672
Spotsylvania.....	28	18	46	996	744	1,740	754	448	1,202
Stafford.....	24	8	32	992	335	1,327	536	178	714
Staunton.....	11	10	21	490	511	1,001	374	412	786
Surry.....	13	13	26	398	856	1,254	232	387	619
Sussex .....	24	24	48	639	1,208	1,847	412	674	1,086
Tazewell.....	53	7	60	2,593	300	2,893	1,555	179	1,734

## NUMBER OF SCHOOLS, ENROLMENT, ETC.—CONTINUED.

COUNTIES AND CITIES.	SCHOOLS.			ENROLMENT.			AVERAGE DAILY ATTENDANCE.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
	1	2	3	4	5	6	7	8	9
Warren.....	30	7	37	1,404	299	1,703	827	183	1,015
Warwick.....	6	5	11	230	329	559	140	157	297
Washington.....	109	20	129	5,544	793	6,337	3,112	501	3,613
Westmoreland.....	18	14	32	725	1,039	1,764	411	402	813
Williamsburg.....	2	2	4	103	130	233	45	85	130
Winchester.....	8	3	11	474	224	698	350	125	475
Wise.....	29	.....	29	1,848	.....	1,848	921	.....	921
Wythe.....	61	13	74	2,769	575	3,344	1,635	365	2,000
York.....	12	10	22	620	912	1,532	297	428	725
TOTALS.....	4,653	1,907	6,565	194,235	109,208	303,443	115,626	60,845	176,471

## SUMMARIES FOR 1885.

The following figures are taken from the last annual report of Hon. R. R. Farr for the scholastic year ending July 31, 1885:

## SCHOOL POPULATION.

White.....	345,022
Colored.....	265,249
Total.....	610,271

## SCHOOLS.

## Number opened:

White.....	4,658
Colored.....	1,917
Total.....	6,575

## PUPILS.

## Number enrolled:

White.....	194,235
Colored.....	109,208
Total.....	303,443

## Number in average daily attendance:

White.....	115,626
Colored.....	60,845
Total.....	176,471

## Number studying the higher branches:

White.....	8,222
Colored.....	1,342
Total.....	9,564

## Number supplied with text-books at public expense:

White.....	5,877
Colored.....	3,213
Total.....	9,090

## Percentage of school population enrolled:

White.....	62
Colored.....	45
Total.....	53.5

*Percentage of attendance on average monthly enrolment :*

White.....	.....	76
Colored.....	.....	76
<b>Total.....</b>	.....	<b>76</b>
Average age of pupils.....	.....	11 years.
Average number of pupils per teacher.....	.....	46
Average number of months taught.....	.....	5.92
Cost of tuition per month per pupil enrolled.....	.....	\$0 60
Cost of tuition per month per pupil in average daily attendance.....	.....	1 02
Whole cost of education per month per pupil enrolled.....	.....	70
Whole cost of education per month per pupil in average daily attendance,	.....	1 19

**TEACHERS.**

Number of white males.....	.....	2,441
Females .....	.....	2,491
	.....	—
	.....	4,932
Number of colored males.....	.....	910
Females .....	.....	751
	.....	—
	.....	1,661
<b>Total number of teachers.....</b>	.....	<b>6,593</b>

*Average monthly salaries :*

Males.....	.....	\$31 00
Females.....	.....	26 88

**SCHOOL HOUSES.**

Number owned by districts....	.....	3,873
Number built during the year.....	.....	330
Value of school property owned by districts.....	.....	\$1,819,256 83

Cost of the system for all purposes to all sources for the year, including balance due for the year :

*For current expenses.*

For pay of teachers.....	.....	\$1,060,620 96
For pay of superintendents.....	.....	43,039 96
For treasurers.....	.....	30,324 01
For rent, fuel and lights.....	.....	47,011 36
For pay of district clerks.....	.....	20,491 12
For books for indigent children .....	.....	6,050 35
For insurance.....	.....	2,078 15
For expenses of boards of school commissioners.....	.....	3,489 30
For other contingent expenses.....	.....	27,375 01
For "Educational Journal".....	.....	640 60
For expenses of central office .....	.....	8,373 07
		—
		\$1,249,493 89

*For permanent improvements.*

For real estate, buildings, furniture and repairs.....	.....	\$170,171 86
For school apparatus.....	.....	4,865 94
<b>Total.....</b>	.....	<b>\$1,424,531 69</b>

## TEXT-BOOKS.

The Board of Education has adopted the following list of text-books for use in the public schools of the State for a term of four years, beginning August 1, 1886.

The agreement with the publishers of the books adopted is, that they will provide a supply of books in each county in which they are used, sufficient for the use of the schools thereof, at a cost to the pupils not to exceed the present wholesale price.

The policy adopted by the Board of Education does not necessitate changes of text-books in any county or city of the State, but leaves the question to be determined by the county and city school boards. Counties and cities having other books than those on the prescribed list, can continue in use any one or every one of the books they now have, or they can change any one or every one of them at any time during the next four years. But all changes must be to the books adopted by the Board of Education. Where no change is desired, no action on the part of the county or city board is necessary, as the books now in use will be continued until displaced by the adoption of other books.

## BOOKS ADOPTED.

## PUBLISHERS.

*J. P. Bell & Co., Lynchburg, Va.:*

Magill's History of Virginia.

*Houghton, Mifflin & Co., Boston :*

Cooke's Virginia [for supplementary reading].

*J. B. Lippincott & Co., Philadelphia :*

Worcester's Primary Dictionary.

Worcester's New School Dictionary.

Worcester's Comprehensive Dictionary.

Worcester's Academic Dictionary.

*A. Lovell & Co., New York city :*

Graphic Copy Books (large).

Graphic Copy Books (small).

*University Publishing Co., New York city :*

Venable's First Lessons in Numbers.

Venable's Intermediate Arithmetic.

Venable's Mental Arithmetic.

Venable's Practical Arithmetic.

Holmes' New History of United States.

Maury's Elementary Geography.  
Maury's Revised Manual of Geography.  
Maury's Revised Physical Geography.

*Van Antwerp, Bragg & Co., Cincinnati:*

McGuffey's Revised Primer.  
McGuffey's Revised First Reader.  
McGuffey's Revised Second Reader.  
McGuffey's Revised Third Reader.  
McGuffey's Revised Fourth Reader.  
McGuffey's Revised Fifth Reader.  
McGuffey's Revised Sixth Reader.  
McGuffey's Revised Speller.  
Harvey's Revised Elementary Grammar.  
Harvey's Revised English Grammar.

NOTE.—School Officers will bear in mind that while no requirement is made that cities or counties *shall* change the text-books previously adopted and in use, all text books which shall be adopted at any time within the ensuing four years in place of those now in use, shall be taken from the list above prescribed. This provision for gradual changes of text-books through a period of four years according as such changes may be deemed expedient, will, it is believed, reduce to a minimum the inconvenience to the schools and the expense to the people.











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